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LISTING OF TECHNICAL REPORTS  
PUBLISHED FROM CY 1974  
THROUGH CY 1986  
PART III of III (PAGES 501-691)

J.A. BIER

HQ AFESC/RDXI  
AF ENGINEERING & SERVICES CENTER  
TYNDALL, AFB FL 32403

OCTOBER 1987

FINAL REPORT

JANUARY 1974 - DECEMBER 1986

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AIR FORCE ENGINEERING & SERVICES CENTER  
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SECURITY CLASSIFICATION OF THIS PAGE

AD-A191173

REPORT DOCUMENTATION PAGE				Form Approved OMB No 0704-0188	
1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED		1b. RESTRICTIVE MARKINGS			
2a. SECURITY CLASSIFICATION AUTHORITY		3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release. Distribution Unlimited.			
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE					
4. PERFORMING ORGANIZATION REPORT NUMBER(S) ESL-TR-87-01 Part III		5. MONITORING ORGANIZATION REPORT NUMBER(S)			
6a. NAME OF PERFORMING ORGANIZATION Air Force Engineering & Services Laboratory (HQ AFESC/RD)	6b. OFFICE SYMBOL (if applicable) RDXI	7a. NAME OF MONITORING ORGANIZATION			
7c. ADDRESS (City, State, and ZIP Code) Tyndall Air Force Base Panama City Florida 32403		7b. ADDRESS (City, State, and ZIP Code)			
8a. NAME OF FUNDING/SPONSORING ORGANIZATION Air Force Engineering and Services Center	8b. OFFICE SYMBOL (if applicable) RDXI	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER			
10c. ADDRESS (City, State, and ZIP Code) Tyndall Air Force Base Panama City Florida 32403		10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO	PROJECT NO	TASK NO	WORK UNIT ACCESSION NO
11. TITLE (Include Security Classification) Listing of Technical Reports Published Calendar Year 1974 through Calendar Year 1986. Part III of III					
12. PERSONAL AUTHOR(S) Jeffrey A. Bier					
13a. TYPE OF REPORT Final	13b. TIME COVERED FROM 1 Jan 74 to 31 Dec 86	14. DATE OF REPORT (Year, Month, Day) October 1987	15. PAGE COUNT 691		
16. SUPPLEMENTARY NOTATION Availability of this report is specified on reverse of front cover.					
17. COSATI CODES FIELD    GROUP    SUB-GROUP 13        02        00		18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number) Civil Engineering Environmental Engineering			
19. ABSTRACT (Continue on reverse if necessary and identify by block number) This technical report lists all technical reports published by this Laboratory from calendar year 1974 through calendar year 1986. It provides MAJOMs and other potential users with abstracts and information needed to order more copies of each report from Defense Technical Information Center (DTIC) and National Technical Information Services (NTIS). This publication is broken into Parts I, II, and III because of its length. Part I consists of pages 1 through 196, Part II contains pages 197 through 500, and Part III contains pages 501 through 691.					
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT <input type="checkbox"/> UNCLASSIFIED/REDUCED/UNLIMITED <input checked="" type="checkbox"/> SAME AS RPT <input type="checkbox"/> DTIC USERS		21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED			
22a. NAME OF RESPONSIBLE INDIVIDUAL Captain Jeffrey A. Bier		22b. TELEPHONE (Include Area Code) 904/283-6244		22c. OFFICE SYMBOL RDXI	

## PREFACE

This report was prepared by the Headquarters Air Force Engineering and Services Center, Engineering and Services Laboratory (HQ AFESC/RDXI), Tyndall Air Force Base, Florida 32403.

This report contains a compilation of Engineering and Services Laboratory (ESL) technical reports covering civil and environmental engineering research and development published between calendar years 1974 and 1986. This list was obtained from Defense Technical Information Center and prepared by our Technical Library. AFESC/RDXI project officer was Captain Jeffrey A. Bier

This technical report has been reviewed and is approved for publication

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DRIC REPORT BIBLIOGRAPHY				SEARCH CONTROL NO	055028
AD A119 030	13/1	21/4	21/2	13/2	CONTINUED
SYSTEMS TECHNOLOGY INC	XENIA OH				
(U) A Field Test Using RDF In A Spreader Stoker Hot Water Generator					
Final rept Sep 80-JUL 81.					
AIR S1	137P				
PERSONAL AUTHORS	Carpenter, Paul F	Kleinhenn, Ned J			
CONTRACT NO	MISPR-N-80-47				
OBJECT NO	2054				
TAKE NO	50				
CHRONATOR	AFESCI/ESI TR-81-57				

UNCLASSIFIED REPORT

ABSTRACT (U) The objective of this report was to provide an evaluation of boiler performance and environmental emissions when combusting densified forms of refuse-derived fuels (RDF) in a military scale 40-100 MMBTU capacity spreader stoker fired boiler. The boiler tested is located in Building 1210, Heating Facility at Wright-Patterson Air Force Base, Ohio. The field test team was assigned to investigate (1) the material handling characteristics of RDF, (2) boiler performance, (3) boiler efficiency, spreader performance, (4) RDF production, combustion properties, slagging, fouling, and coking, and (5) environmental emissions, i.e., electrostatic precipitator performance, particulate emissions (size, mass rate, and resistivity), gaseous emissions and trace metal emissions. The test demonstrated that firing unblended RDF can be performed with minimal impact on the operational performance of a military hot water generator operated at one-third of its capacity. The boiler burned well with adequate fuel burnout and boiler response. A three and one-half percent decrease in efficiency occurred during RDF firing. There was no significant change in electrostatic precipitator removal of particulate emissions as a result of firing RDF compared with coal. Some heavy metal emissions (nickel, zinc, chromium) were higher for RDF than coal (Author)

AD-A119 030

AD-A119 030

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DTIC REPORT BIBLIOGRAPHY				SEARCH CONTROL NO	055028	
AD-A118 930	11/2	13/2	1/5	AD-A118 287	13/2	21/4
NEW MEXICO ENGINEERING RESEARCH INST ALBUQUERQUE				CALIFORNIA UNIV RIVERSIDE STATEWIDE AIR POLLUTION		
(U) Portland Cement Concrete Recycling Technology Review				RESEARCH CENTER		
DESCRIPTIVE NOTE Final rept Aug 81-Jan 82.				(U) Atmospheric Reaction Mechanisms of Aniline Fuels		
JAN 82	70P	MAR 82	222P	PERSONAL AUTHORS	Tuzson, Ernest C, C., Jr., William P. L., Brown, Richard V., Atkins, Roger, Miner, Arthur M.	
PERSONAL AUTHORS	McKeen, R., Gordon, Newcomb, David E.	REPORT NO	AMERI-15 07-TAS-8	CONTRACT NO	F08605-81-C-0041	
REPORT NO	F28801-A1-C-0013	PROJECT NO	2104	PROJECT NO	1L1H	
CONTRACT NO		TASK NO	1A	TASK NO	81	
PROJECT NO		MONITOR	AFESCI/ESL	MONITOR	AFESCI/ESL	
TASK NO			TK-B2-11		TK-B2-17	

## UNCLASSIFIED REPORT

**ABSTRACT** (U) This report describes a detailed investigation of the atmospheric reactions of hydrazine (N2H4), monomethyl hydrazine (MMH), and unsymmetrical dimethyl hydrazine (UDMH) relevant to assessments of the impact of their releases to the atmosphere as a result of their wide use as fuels for military purposes. Experiments were conducted in 3800 l and 6400 l Tarlum reaction chambers, with reactant and product 1 mol/L concentrations measured by long pathlength (188-3-1112.4 m) Fourier transform infrared (FTIR) spectroscopy.

**DESCRIPTIONS** (U) The review of current technology pertaining to the recycling of existing portland cement concrete pavements was conducted. The purpose was to assess the applicability of recycling to U.S. Air Force pavement rehabilitation work. Costs of alternatives were reduced to simple models for use in evaluating sensitivity to cost factors. A study of projects on which this technology was used identified aggregate cost and haul distance as key factors.

**DESCRIPTORS** (U) Cements, Concrete, Recycled materials, Landing fields, Pavements, Cost analysis, Air Force facilities, State of the art

**IDENTIFIERS** (U) PEG3723F, WUAFESCI212041A2B

**ABSTRACT** (U) This report describes a detailed investigation of the atmospheric reactions of hydrazine (N2H4), monomethyl hydrazine (MMH), and unsymmetrical dimethyl hydrazine (UDMH) relevant to assessments of the impact of their releases to the atmosphere as a result of their wide use as fuels for military purposes. Experiments were conducted in 3800 l and 6400 l Tarlum reaction chambers, with reactant and product 1 mol/L concentrations measured by long pathlength (188-3-1112.4 m) Fourier transform infrared (FTIR) spectroscopy.

**DESCRIPTIONS** (U) Air pollution, Aniline fuels, Toxic hazards, Rocket propellants, Methyl hydrazines, Direct hydrazines, Reaction kinetics, Fugue, Absorption coefficients, Concentration (chemistry), Hydrazines, Infrared spectra, Atmospheres, Release

**IDENTIFIERS** (U) Tech on, PEG1104F, WUAFESCI1R81O1

## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. 055028

AD-A117 928 21/4 7/4 13/2

RYCON INC CINCINNATI OH

(U) Performance Analysis of Coal/Char Denitrified Refuse Derived Fuel in a Military Boiler

DEScriptive NOTE Final rept Aug 20-Sep 61

DEC 81 93P

CONTRACT NO. MIPR-N-80-50

PROJECT NO. 2054

MONITOR AFESC/ESL

TR-81-50

## UNCLASSIFIED REPORT

PERSONAL AUTHORS MacIntyre, W. G., Smith, C. L., DeFur, P.

(U) , SU, C. W.

CONTRACT NO. F08835-61 C-0019

PROJECT NO. 1900

TASK NO. 20

MONITOR AFESC/ESL

TR-B2-00

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE Includes ten microfiche inserts

**ABSTRACT** (U) This report provides an overview of existing denitrified refuse derived fuel (DRDF) receiving, storage, handling and combustion equipment at Wright-Patterson Air Force Base. DRDF is being pursued as part of a long term alternative fuel evaluation program to develop design and procurement criteria for multiple fuel use. Recommendations are offered for specific equipment, procedural changes, and studies to improve the efficiency of the present configurations of DRDF as a fuel. A discussion of the fuel use criteria is presented. The options for continuing the present DRDF supply arrangement via the feasibility of local production of DRDF are presented. Research needs are summarized. A prospective integrated local synthetic solid fuel production facility and boiler performance test is recommended as a continuation of the program (Author)

**DESCRIPTORS** (U) \*Solid wastes. \*Solid fuels. \*Boilers. \*Synthetic fuels. Combustion. Density. Test methods. Safety. Air Force facilities.

IDENTIFIERS (U) WUA-TSC20545017. PE04708F

AD-A117 928 21/4 7/4 13/2

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UNCLASSIFIED (U) PE02601F WUA-FES-19002028

AD-A118 022

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UNCLASSIFIED (U) PE02601F WUA-FES-19002028

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## DTIC REPORT BIBLIOGRAPHY

AD-A117 875	8/8	21/8	SEARCH CONTROL NO	055028
ENGINEERING-SCIENCE INC	ARCADIA CALIF		AD-A117 587	1/5
(U)	Vapor Condensation Control of JP-4 Emissions from Underground Storage Tanks at March Air Force Base, California		BDM CORP MCLEAN VA	19/4
DESCRIPTIVE NOTE	Final rept Sep-Oct 81.		(U) The Study of Foreign Object Damage Caused by Aircraft Operations on Unconventional and Bomb-Damaged Airfield Surfaces	15/7
BAY 82	38P		DESCRIPTIVE NOTE	Final rept Sep 80-Jun 81.
PERSONAL AUTHORS	Holtz, Donald P., Cottore, Lawrence C.		JUN 81	172P
CONTRACT NO	F23615-80-D-4001		PERSONAL AUTHORS	Boatty D N, Readdy, F., Gearhart, J. J
PROJECT NO	19000		REPORT NO	BDA/W-81-029-TR
TASK ID	70		CONTRACT NO	FORB35-80-C-0208
MONITOR	AFESC/ESL		PROJECT NO	2104
	TQ-82-01		TASK NO	2B
			MONITOR	AFESC/ESL
				TR-81-39

## UNCLASSIFIED REPORT

ABSTRACT (U) Three efficiency test runs were conducted on an engine oil recovery system at Hydrocarbon Vapor Recovery Unit No. 01 at the March Air Force Base Recovery Unit No. 02 on 10/00 at the March Air Force Base Panaro refinery on 10/22 and 10/23 September and 1 October 1981. The recovery system was installed to control JP-4 vapors dispersed from the filling in underground tanks. The purpose of the test was to assess the compliance with South Coast Air Quality Management District Rule 802 specifying minimum efficiencies for vapor condensation systems (Author)

DESCRIPTORS (U) "Air pollution" "Air pollution control equipment" "Jet engine fuels" "Oil storage" "Vapors" "Vapor deposition" "Emission control" "Underground facilities" "Storage tank" "Condensation" "Recovery" "Methodology" "Performance" "Engineering" "Testing"

IDENTIFIERS (U) JP-4 fuel. Hydrocarbon fuels. PEB2801F. MAFFESC18007002

## UNCLASSIFIED REPORT

ABSTRACT (U) This technical report documents the results of analyses conducted to assess the current level of technology available to determine the probability and extent of FOD to aircraft operating from conventional and bomb-damaged airfield surfaces. The various mechanisms (i.e. jet blast, tire/ground interaction, which can create particles which can then cause damage and the level of susceptibility) of various aircraft to damage are considered. Engine and frame vulnerability to FOD is assessed and FOD prevention techniques currently being used are evaluated. The analysis concludes that the current level of technology only permits a qualitative understanding of FOD potential and identifies the information and data necessary to develop a quantitative relationship between debris characteristics and the extent of damage. In addition, a test plan is recommended to establish the quantitative relationship and to permit the development of a prediction methodology (Author)

DESCRIPTORS (U) "Landing jets" "Runways" "Operational readiness" "Tire damage" "Dabris" "Aircraft landings" (Author)

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## DTIC REPORT BIBLIOGRAPHY

AD-A117 587 CONTINUED

Takeoff, Damage assessment, Forecasting, Probability, InspectionEngines), Airframes, Landing gear, Tires, Data acquisition, Test methods, Military aircraft, Commercial aircraft, Air Force operations Predictions

IDENTIFIERS (U) \*FOD (Foreign Object Damage), RRR(Rapid ALS(Alternate Launch and Recovery Surface), RRR(Rapid Turnaround), Spill/Bomb Damage Repair), Unconventional Airfields, F-4, Spill/Bomb Damage Repair, A 10 aircraft, B-737 aircraft, C-130 aircraft, C-141 aircraft, P-6072AF, MUAF/SC2 042855

SEARCH CONTROL NO 055028

AD-A117 585 9/2 21/5 21/2 6/6

NEW JERSEY INST OF TECH NEWARK

(U) Predictive Model for Jet Engine Test Cell Opacity DESCRIPTIVE NOTE Final rept 1 Jul 80-30 Sep 81

SEP 81 74P

PERSONAL AUTHORS Lewandowski Gordon A.

CONTRACT NO FORBES, BO-C-0222

PROJECT NO 1800

TASK NO 80

MONITOR AFESC/ESL

TR 81 40

## UNCLASSIFIED REPORT

ABSTRACT (U) A computer program (written in FORTRAN for CDC 6800) was developed to predict the plume opacity of jet engine test cells. The data input required for the model includes the particle density, composition, and size distribution in the exhaust gas, and the effective stack diameter. Previous data obtained for J-5 engines were used to test the model, and the difference between the theoretical and measured transmittance was generally within one percent. The program also predicts the theoretical effect of using electrostatic precipitators or venturi scrubbers to treat the exhaust emissions. These predictions indicate that control devices larger than the test cells would have to be installed to even achieve a minimal effect on the observed visibility (Author)

DESCRIPTORS (U) Computer programs, Jet engines,

\*Exhaust plumes, Emission control, Smoke stacks, Predictions, Computations, Flight simulation, ForTRAN, Baffles, Specifications, Test and evaluation, Aircraft models, Exhaust gases, Light scattering, Opacity Predictions, Boat, Particles, Con., oil systems, Electrostatic precipitation, Scrubbers, Test fixtures IDENTIFIERS (U) CDC 6800 computers, J-57 engines, Venturi scrubbers, Test cells, Predictive models, MUAF/SC2 042855

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## DTIC REPORT BIBLIOGRAPHY

AD-A117 084 10/1

ULTRASYSTEMS INC FAIRFAX VA

(u) Advanced Bio-Energy Systems for Air Force  
Institutions

DESCRIPTIVE NOTE Final rept Feb 80-Jan 81.

OCT 81 100F

PERSONAL AUTHORS Huff, M; Nixon, J., Bond, Desmond H.

CONTRACT NO DCA31-69-0-0020

PROJECT NO 2034

TASK NO 50

MONITOR FEGAT-AFESCAESL  
2110-K-81-11

## UNCLASSIFIED REPORT

## Availability Document partially illegible

**ABSTRACT** (u) This investigation was sponsored by the US Air Force to determine the potential of using renewable biomass energy conversion technology interface with independent energy generating hardware to sustain total annual facility energy requirements on a freestanding airbase. The investigation found that Coal in Ash, FL has high potential for such a system. (u) At that center, components and subsystems required for evaluation and demonstration in an Air Force base environment before full implementation is possible. The investigation found that a biomass energy island system could be achieved through a centralized biomass gasification/combined cycle system to produce 135,000 lb/hr 150 psig steam (saturated) and 27 kWh/hr electrical power from 1480 green tons of wood chips daily. A phased implementation system is recommended consisting of separate integrable generator modules for combined cycle wood gasification and/or combustion which would convert into an expanded biomass energy self-sufficient system. The investigation did not consider harvesting or base woodlands, which is the subject of a separate effort to define the wood resource aspects of a total biomass self-sufficient system. (Author)

AD-A117 084

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## SEARCH CONTROL NO 056026

AD A117 084 CONTINUED

**DESCRIPTIONS** (u) Biomass conversion, Energy conversion, Electric power production, Air force facilities, Feasibility studies, Test and evaluation, Surveys, Economic analysis, Costs, Requirements, Electricity, Natural gas, Benefits, Tables, Data

IDENTIFIERS (u) WIAFES20545024, PFR4708F

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ORIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A110 455 1/6 1/1

OAK RIDGE NATIONAL LAB TN

(u) Krypton-85 Powered Lights for Airfield Application

DESCRIPTIVE NOTE Final rept Oct 76-Sep 80.

NOV 81 24P

PERSONAL AUTHORS Gane, G. Neill Haff, Karl W.

PROJECT NO 2103

TASK NO 60

MONITOR AFESC/ESL

TR-80-65

## UNCLASSIFIED REPORT

**ABSTRACT** (u) Airfield lighting is complex in its requirements for lights of various intensities and colors. Some applications such as taxway lights, information signs, and combat situations may be served by lights of relatively low intensity. They should meet criteria such as energy efficiency, little or no dependence upon batteries or generators, low maintenance, and rapid deployment. Lights powered with Krypton-85 provide some of these advantages. This report summarizes an effort to develop Krypton-85 powered airfield lighting. Light is produced when beta rays from Krypton-85 excite a phosphor. Phosphor selected produced blue, red, and yellow-green light. Field testing of the lights was sufficiently encouraging to continue development in a follow-on effort (author)

**DESCRIPTORS** (u) \*Airports, \*Landing lights, Krypton, Lighting equipment, Landing fields, Field tests, Colors, Phosphors, Electric batteries, Energy conservation, Low intensity, Efficiency

**IDENTIFIERS** (u) Krypton powered lights PEU37235  
WUAFESC2103013

## UNCLASSIFIED REPORT

**ABSTRACT** (u) This report describes the design, fabrication, installation and testing of a small variable-speed vertical axis wind turbine (VANT). This VANT is unique in its installation using hand tools only, unconventional and simple support system, and variable speed operation under microprocessor control. Initial testing confirmed that the turbine can be controlled by commanded alternator field modulation. Further studies will be directed toward determination of an optimum control algorithm

**DESCRIPTORS** (u) \*Wind, \*Energy conversion, \*Turbines, \*Wind, \*Installation, \*Tubers, \*Test methods, Microprocessors, Control systems, Algorithms, Vertical orientation

**IDENTIFIERS** (u) VANT (Vertical Axis Wind Turbines), Wind turbines, \*Variable speed operation, \*Vertical axis wind turbines, WUAFESC21030007, PEU4708f

## UNCLASSIFIED

AD-A115 946	21/4	7/4	DTIC REPORT BIBLIOGRAPHY	SEARCH CONTROL NO	055028
SRI INTERNATIONAL MENLO PARK CA	(U) Analysis and Environmental Fate of Air Force Distillate and High Density Fuels			CONTINUED	
DESCRIPTIVE NOTE	Final rept Aug 80-Oct 81.			AD-A115 949	
OCT 81	160P			water and evaporation of the pure fuels be studied in detail because they may be the rate-limiting transport processes	
PERSONAL AUTHORS	Smith, J H	Harper, J C	Jaber, H	DESCRIPTORS (U) Jet engine fuels, Gas chromatography, Environmental tests, Distillates, Mass spectrometry, Hydrocarbons, Identification, Molecular weight, Isomers, Volatility	
CONTRACT NO	F08835-80-C-0122			IDENTIFIERS (U) JP-4 fuel, JP-5 fuel, JP-8 fuel, LPN-SRI-PMU-1814, MUAFESC18002050, PE82301f	
PROJECT NO	1900				
TASK NO	20				
MONITOR	AFESC/ESL				
	TR-81-54				

## UNCLASSIFIED REPORT

ABSTRACT (U) Five high density fuels (RJ-4, RJ-5, RJ-8, JP-8, and JP-10) and three distillate fuels were analyzed by capillary column gas chromatography (GC). The major components of the distillate fuels were identified by gas chromatography/mass spectrometry (GC/MS). The molecular weight of the isomers of the high density fuel components were also determined, but the structures of only a few components were assigned by comparing the GC retention times with authentic samples. The concentration and identity of the major water-soluble fuel components were also identified. The volatilization rates of the water-soluble components of JP-4, JP-8, and JP-10 were measured by preparing solutions of the fuel components in water, stirring at three stirring rates, and measuring the rate of decrease of the concentration of each component by GC as a function of time. The water-soluble components of JP-4 were photolyzed for 21 days in sunlight in deionized water, natural seawater, and water from a local pond. The distribution of the fuel components was estimated using the method recently proposed by Mackay and Patterson. The alkanes should partition almost entirely into the atmosphere, the monoaromatics should be in both the air and water, and the naphthalene should partition into the water and the sediment phases. Adsorption of the alkanes and monoaromatics should not be a major environmental fate. It is recommended that the rate of dissolution in

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SEARCH CONTROL NO 02-0228

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CALIFORNIA UNIV

RIVERSIDE STATEWIDE AIR POLLUTION

RESEARCH CENTER

(U) Atmospheric Chemistry of Hydrocarbon Fugitives

Volume 1

Fugitives. Results, and Discussion

Final rept Mar 80 Sep 81

DESCRIPTIVE NOTE

Fugitive

Report Mar 80 Sep 81

DESCRIPTIVE NOTE

Final rept Mar 80 Sep 81

REV 81

145P

TSP

PERSONAL AUTHORS

Carter, William P.

Ripley, Paul S.

Smith, Cecilia G.

Pitts, James H., Jr.

REPORT NO

NAERI-TAS-1

CONTRACT NO

F203601-78-C-0015

F203601-81-C-0013

PROJECT NO

2104

PROJECT NO

1100

TASK NO

20

MONITOR

AFESC/ESL

TR-81-53 VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE

See also Volume 2 Part 1, AD-A113

605

ABSTRACT

(U) Organic compounds

in hydrocarbon fuels can

be released into the atmosphere

in the presence of NOx

and sunlight, affect air

quality both in the vicinity of

their release and in downwind regions. Potentially

adverse air quality impacts include the formation of

ozone and a spectrum of other photochemical oxidants, the

formation of secondary aerosols, and in certain cases, the

formation of toxic organic products. This program was

designed to experimentally investigate the potential of

selected Air Force and commercial fuels for producing

some or all of these impacts. A total 132 single

and multi day outdoor environmental chamber experiments were

carried out involving nine fuels. These included the

naphtha-derived JP-4 and JP-6 military aviation fuels

their shale oil derived analogues, unleaded gasoline,

diesel No. 2 fuel, and the experimental high-energy

fuels No. 10, RJ-4, and RJ-5. The results

of this study show that the Air Force fuels JP-4 and JP-6

(both petroleum and shale-derived) are significantly

less reactive with respect to rates of oxidant formation

and NO to NO<sub>2</sub> conversion than unleaded gasoline. The

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SEARCH CONTROL NO 02-0228

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CALIFORNIA UNIV

RIVERSIDE STATEWIDE AIR POLLUTION

RESEARCH CENTER

(U) Atmospheric Chemistry of Hydrocarbon Fugitives

Volume 1

Fugitives. Results, and Discussion

Final rept Mar 80 Sep 81

DESCRIPTIVE NOTE

Fugitive

Report Mar 80 Sep 81

DESCRIPTIVE NOTE

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REV 81

145P

TSP

PERSONAL AUTHORS

Carter, William P.

Ripley, Paul S.

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SUPPLEMENTARY NOTE

See also Volume 2 Part 1, AD-A113

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13 1/2

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RIVERSIDE STATEWIDE AIR POLLUTION

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REPORT NO

NAERI-TAS-1

CONTRACT NO

F203601-78-C-0015

F203601-81-C-0013

PROJECT NO

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PROJECT NO

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TASK NO

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MONITOR

AFESC/ESL

TR-81-53 VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE

See also Volume 2 Part 1, AD-A113

605

ABSTRACT

(U) Organic compounds

in hydrocarbon fuels can

be released into the atmosphere

in the presence of NOx

and sunlight, affect air

quality both in the vicinity of

their release and in downwind regions. Potentially

adverse air quality impacts include the formation of

ozone and a spectrum of other photochemical oxidants, the

formation of secondary aerosols, and in certain cases, the

formation of toxic organic products. This program was

designed to experimentally investigate the potential of

selected Air Force and commercial fuels for producing

some or all of these impacts. A total 132 single

and multi day outdoor environmental chamber experiments were

carried out involving nine fuels. These included the

naphtha-derived JP-4 and JP-6 military aviation fuels

their shale oil derived analogues, unleaded gasoline,

diesel No. 2 fuel, and the experimental high-energy

fuels No. 10, RJ-4, and RJ-5. The results

of this study show that the Air Force fuels JP-4 and JP-6

(both petroleum and shale-derived) are significantly

less reactive with respect to rates of oxidant formation

and NO to NO<sub>2</sub> conversion than unleaded gasoline. The

## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 02-0228

AD-A115 518

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CALIFORNIA UNIV

RIVERSIDE STATEWIDE AIR POLLUTION

RESEARCH CENTER

(U) Mathematical Prediction, Conduction, and Simulation

Validation, Measurement, Strain Mechanics, Deformation, Gages, Strain Gages

DESCRIPTORS

(U) Mathematical Prediction, Conduction, and Simulation

Validation, Measurement, Strain Mechanics, Deformation, Gages, Strain Gages

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Validation, Measurement, Strain Mechanics, Deformation, Gages, Strain Gages

DESCRIPTORS

## UNCLASSIFIED

AD-A115 528 CONTINUED

cruise-missile fuels JP-10, RU 4, and RU-5 exhibit still lower reactivities. Under the 'meteorological' conditions encountered during this study, the same general reactivity ranking was observed for multi-day irradiations conditions. However, under 'multi-day' static irradiations with no further introduction of reagents, all of the military fuels (1 a) both kerosene-derived and high-energy) had similar maximum ozone-forming potentials

DESCRIPTORS: (U) "Atmospheric chemistry", "jet engine fuels", "automotive fuels", "diesel fuel", "air quality", "hydrocarbons", "aviation fuels", "oil shales", "fuel additives", "gasoline", "reaction kinetics", "ozone", "reactivities", "nitrogen oxides", "oxidation", "aerosols", "simulation", "environmental impact", "test methods", "Chambers", "Shaver (Data)

IDENTIFIERS (U) WUAF/ESC10002020, PEB201F

## OTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 045028

AD-A115 443

20/F.

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MASSACHUSETTS INST OF TECH Lexington Lincoln Lab

(U) Remote sensing of turbine Engine Gases

DESCRIPTIVE NOTE Final rept 1 Oct 80-30 Sep 81.  
SEP 81 81P

PERSONAL AUTHORS Klinger, Dennis K., Benyuk, Norman, Mardon, Alan.

MATERIALS, AREA

CONTRACT NO F19628-80-C-0002

PROJECT NO 1300

TASK NO 20

MONITOR ESD/AFESC/ESL

TR-82-014, TR-82-016

## UNCLASSIFIED REPORT

ABSTRACT (U) This is the FY 81 final report on the program entitled 'Remote Sensing of Turbine Engine Gases'. The specific tasks which were conducted during FY 81 consisted of the following: (1) the feasibility demonstration of a dual-laser differential absorption LIDAR (DIAL) system for the remote sensing of CO, NO, and C2H4; (2) the development of a data acquisition and processing system for the dual-laser DIAL system; (3) the laser remote sensing of CO and C2H4 in the exhaust of a stationary jet aircraft; and (4) the laser remote sensing of hydrazine, monomethylhydrazine (MMH), and unsymmetrical dimethylhydrazine (UDMH).

DESCRIPTORS (U) "laser", "remote detectors", "Fethus gases", "gas turbines", "jet engines", "Dual mode", "MMH", "hydrazine", "Carbon monoxide", "Diethylhydrazines", "Data acquisition", "Feasibility studies", "Data processing", "jet aircraft", "Stationary

IDENTIFIERS (U) Dual laser, WUAF/ESC10002020, PEB201F

AD-A115 528

AD-A115 443

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PAGE 275 055028

## UNCLASSIFIED

AD-A119 213 1973 13/2 AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL ENGINEERING AND SERVICES LAB

(U) Evaluation of Dual Drive Vibratory Rollers for Rapid Runway Repair

DESCRIPTIVE NOTE Final rep't Aug-Nov 80.

MAR 01 1985

PERSONAL AUTHORS Alphonse, Edgar F. -Graham, R. William

REPORT NO AFESL/ESL "K-31-38

PROJECT NO 2621

TASK NO 20

UNCLASSIFIED REPORT

ATIC REPORT 0111.20GRAPHY SEARCH CONTROL NO 055024

AD-A114 885 13/2 1/2 9/2

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL

(U) Development of a Pavement Maintenance Management System Volume VIII: Development of an Airfield Pavement Maintenance and Repair Consequence System

DESCRIPTIVE NOTE Final rep't Jan 80-Apr 81.

APR 31 90P

PERSONAL AUTHORS Shafin, N. Y. Khan, S. D. Lytton, R. L. Jephcott, E. J.

REPORT NO AFESL/ESL TR-C-1-19-VOL-6

PROJECT NO 2054

TASK NO 4P

UNCLASSIFIED REPORT

ABSTRACT (U) Two dual drum vibratory rollers were evaluated and compared to standard Air Force single drum roller. The rollers were evaluated on their ability to compact graded crushed limestone and their ability to reduce the time required to compact crushed limestone for use in runway repair. The repair was tested with F-4 fighter aircraft traffic. It was determined that a single 12' weight, dual drum roller can compact limestone as well as the present Air Force single drum roller and do the job in 50% less time (Author)

DESCRIPTORS (U) \*Rollers, Runways, Road damage, Craters, Repair, Quick reaction, Rock, Compacting, Road building equipment, Vibrators(Mechanical), Field tests

IDENTIFIERS (U) Some design config. crushed stone, \*Road rollers, PED4708F, WAFES ESL 20122008

ABSTRACT (U) This report documents development of the Airfield Pavement Management System (APMS). A computerized system for analyzing airfield pavements. The system provides (1) a method for determining feasible maintenance and repair (MAR) alternatives for a given pavement feature, (2) a procedure for performing economic analyses to compare various MAR alternatives for a given pavement feature, and (3) a procedure for forecasting the Pavement Condition Index and key distress as a function of applying the MAR alternative to a given part, or airfield pavement feature. APMS now consists of seven modules designed to (1) perform evaluation summary (2) perform localized repair analysis, (3) evaluate the consequences of localized repair, (4) evaluate the consequences of other MAR, (5) perform cost analysis, (6) perform benefit analysis, and (7) perform budget optimization (Author)

DESCRIPTORS (U) \*Pavements, Maintenance, Repair, Costs, Benefits, Lading fields, Maintenance, Repair, Costs, Benefits, Military buildings, Computer applications, Pavement construction

IDENTIFIERS (U) \*APMS(Airfield Pavement Management System) PLE34708F WAFESL20122008

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AD A-16 805

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## UNCLASSIFIED

AD-A114 556	1/3	DTIC REPORT BIBLIOGRAPHY	SEARCH CONTROL NO	05502A	13/2	5/9	13/12
AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL		AD A114 380	AIR FORCE ENGINEERING AND SERVICES LAB	ENGINEERING AND SERVICES CENTER	TYNDALL AFB FL		
ENGINEERING AND SERVICES LAB			Smoke Abatement System for Crash Rescue/Fire Training				
(u) Takeoff of Jet Fuel-Powered Runway Distancer and Fixtures			(u) Smoke Abatement System for Crash Rescue/Fire Training				
Markups			Facilities				
DESCRIPTIVE NOTE. Final Rpt. DC-00-AWY 81.			CLASSITIVE NOTE	Final rpt. See	Sep 81.		
AD-A114 556		REF ID: 78P	PERSONAL & ITOPS	Kuan, Anthony J.	Hanra, John A.		
PERSONAL AUTHORS. Haff, K. W., Crase, F. M., Tompkins, J. A.		REF ID: AFESC-1R-81-4J					
SCHMITZ, F.		REPORT NO	PROJECT NO	2505			
AFESC/ESL-TR-81-45			REPORT NO	20			
PROJECT NO		TECS	TASK NO				
TASK NO		DF	UNCLASSIFIED REPORT				

## UNCLASSIFIED REPORT

ABSTRACT. (u) The Isotope Technology Group of the Oak Ridge National Laboratory's Radioisotopes Department was asked by the U.S. Air Force to test tritium-powered runway distance and taxiway marker signs. The tests were performed by mutual agreement of the U.S. Air Force and Oak Ridge National Laboratory and were designed to test the serviceability of these signs under adverse weather and handling conditions, calibrating the lighting fixtures, and determine their service life. The testing program and results indicate that the signs will provide a rough and durability requirements for their intended purpose. This report is a discussion of the testing program and the results of these tests. (Author)

DESCRIPTIONS. (u) Runways, taxiways, tritium, markers, Adverse conditions, Weather, kindling, Air force, life expectancy, limitations, power, distance measuring equipment.

IDENTIFIERS. (u) Tritium powered runways, Distance markers, AFESC/ESL-TR-81-45, PE72034

ABSTRACT. (u) This report provides the design for a smoke-abated aircraft crash/rescue trailer. The design is for a 75-ft diameter fire area suitable for operation in freezing and nonfreezing climates. With this system liquid petroleum fuels can be burned with little or no smoke by injecting a fine "tor" spray near the surface of the burning fuel. This method of smoke abatement is being applied at military fire fighting training facilities. The report includes all equipment necessary for the smoke abatement function and provides detailed step-by-step operating procedures. (Author)

DESCRIPTIONS. (u) Smoke abatement, Air pollution, Training devices, Fire fighting, Aircraft fires, Aviation accidents, Crashes, Rescues, Fire suppression, Smoke, Water injection, Sprays, Cost effectiveness.

IDENTIFIERS. (u) FFB4708F, MUAF72SC250S2004

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD A113 811 CONTINUED

PCB230F. WAFESCE1 180203Z

FLORIDA UNIV. GAINESVILLE DEPT OF ENVIRONMENTAL  
ENGINEERING SCIENCES

(U) Field Test of an In-Stack Diffusion Classifier on an

Aircraft Engine Test Cell

DESCRIPTIVE NOTE Final rep. JAR-TRC 80.

APR 81 40P

PERSONAL AUTHORS Lundgren, Dale A., Haussknecht, Orfan J.

CONTRACT NO EPA-R-805-752-02-2

PROJECT NO 1900

TASK NO 20

MONITOR AFESC/ESL

TR 8-21

INCLASSIFIED REPORT

ABSTRACT (U) An in stack diffusion classifier was field tested at Tyndall Air Force Base, Florida. Particle size distribution measurements were made on the exhaust stream from the engine test cell while running a J75-p17 jet engine. Samples were collected at the test cell exhaust plume using a University of Washington in-stack cascade impactor followed, in series, by an in-stack diffusion classifier being developed at University of Florida. In addition, total particulate samples were obtained using absolute filters to determine particulate mass concentration in the exhaust gases. Opacity readings of the plume were also taken during sampling. The procedures to collect significant data and the reasons: problems encountered to generate a reasonable estimate of jet exhaust aerosol size distribution using a diffusion classifier are described in this report. (Author)

DESCRIPTORS (U) \*Test equipment, \*Jet engines, \*Exhaust plumes, \*Particle size, \*Measurement, \*Sampling, Impact, Cascade structures, Collecting methods, Diffusion, Filters, Particulates, Exhaust gases, Aerosols, Field

IDENTIFIERS (U) In stack diffusion classifiers, J 75  
engines Cascade impactors, Diffusion classifiers, AD A113 811

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AD-A113 771 14/2 13/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
FLORIDA UNIV GAINESVILLE DEPT OF ENVIRONMENTAL AD-A113 771 CONTINUED  
ENGINEERING SCIENCES UNAFESCESL21032A50

(U) An 'In-Stack' Diffusion Classifier for Aerosol Mass  
Distribution Measurement

DESCRIPTIVE NOTE Final rept. Jun 78-Jun 80.

APR 81 JBP

PERSONAL AUTHORS Lundgren, Dale A , Rangaraj, Chitham N

CONTRACT NO EPA-R-003782-010

PROJECT NO 2103

TASK NO 2A

MONITOR AFESC/ESL  
TR-81-04

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14

UNCLASSIFIED REPORT

ABSTRACT: (U) A five-stage, screen-type diffusion classifier was designed and built to make in-situ measurement of submicron aerosols at temperatures and pressures encountered in industrial-type exhaust stacks. Laboratory calibration proceeded satisfactorily and field strength of successful field demonstration. However, major problems were encountered in test procedures during both field tests at the U.S. Power Test facility (Florida Electric Authority) (U.F.A.) and the Southside Generating Station, Unit 4 (oil-fired boiler) and the N. E. Air Rework Facility, Jacksonville. Jet Engine test Cell 11 (J-32 engines). Conditioning of the glass fiber filters to sulfur oxides was not done at the Southside Power Plant; this appears to have been the major problem, here. Temperatures of the exhaust stack exceeded 200 C. at the jet engine test (Cell 11). Consequent weight loss due to gross evaporation appears to have been the problem there. (Author)

DESCRIPTORS (U) "Test equipment," "Measurement," "Morphology," "Air pollution," "Smoke stacks," "Diffusion," "Sampling," "Classification," "Industrial plants," "Smoke," "Field tents," "Particle size"

IDENTIFIERS (U) In stack diffusion classifiers, Mass distribution, Submicron aerosols, PR03782F, AD-A113 771

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AD-A113 003	4/1	21/4	DTIC REPORT STERILOGRAPHY	SEARCH CONTROL NO 050028
CALIFORNIA UNIV RIVERSIDE STATEWIDE AIR POLLUTION RESEARCH CENTER			13/2	AD A113 008
(U) Atmospheric Chemistry of Hydrocarbon Fuels			IDENTIFIERS	CONTINUED
Outdoor Chamber Data Tabulations Part II			(U)	PT021
DISCREPANCY NOTE Final rept Mar 80-Sep 81.				
NOV 61	316P			
PERSONAL AUTHORS Carter, William P. L., Ripley, Paul S., Smith, Cecilia Q., Pitts, James N., Jr.				
CONTRACT NO F08035 50-C 0000				

PROJECT NO 1200

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TR-81-53 V-2-F 2  
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GIBB  
GIBB, JAMES  
See also GIBB, JAMES  
Part 1, AD-1112  
Part 2, AD-1113

**ABSTRACT** (U) A total of 132 single- and multi-day outdoor environmental chamber experiments were conducted in this program involving nine different aviation and automotive fuels. These included the petroleum-derived JP-4 and JP-5 military aviation fuels, their shale-oil derived analogues, unleaded gasoline, diesel, No. 2 fuel, and the experimental high-energy cruise-missile fuels JP-6, JP-7, and JP-8. The program was conducted to assess the potential of these fuels to adversely affect aircraft materials. This is Volume II of the report. Due to printing facility limitations, Volume II consists of two separately bound parts which contain the detailed data sheets for the outdoor chamber experiments. This is Part II of Volume II.

**DESCRIPTORS (U)** Air quality, atmospheric chemistry, automotive fuels, diesel fuels, fuel additives, hydrocarbons, aviation fuel, shale fuel, gasoline, combustion products, aerosols, environmental impact, ozone, Gardner Crustation, data processing, experimental data.

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## UNCLASSIFIED

AD-A113 865 4/1 21/4 13/2

CALIFORNIA UNIV RIVERSIDE STATEWIDE AIR POLLUTION  
RESEARCH CENTER

(U) Atmospheric Chemistry of Hydrocarbon Fuels Volume II  
Outdoor Chamber Data Tabulations Part I

DESCRIPTIVE NOTE. Final rept Mar 80-Sep 31.

NOV 81 330p?

PERSONAL AUTHORS Carter, William P. L., Ripley, Paul S.  
Smith, Charles G.; Pitts, James N., Jr.

CONTRACT NO F08035-80-C-C084

PROJECT NO 1200

TASK NO 20

MONITOR AFFSC/ESL  
1R-81-53-V-2-P-1

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330p?

SUPPLEMENTARY NOTE See also Volume 2, Part 2, AD-A113

986

ABSTRACT (U) A total of 132 single and multi-day

outdoor chamber experiments were conducted in this program involving nine different aviation and automotive fuels. These included the petroleum-derived JP-4 and JP-8 aircraft aviation fuels, their marine oil-derived analogs, unleaded gasoline, diverse No. 2 fuel, and the experimental high-energy cruise-missile fuels JP-10, Ru-4, and Ru-5. The program was conducted to assess the potential of these fuels to adversely affect air quality. This is Volume II of the report. Due to printing limitations, Volume II consists of two separately bound parts which contain the detailed data sheets from the outdoor chamber experiments. This is Part 1 of Volume II (author)

DESCRIPTIONS (I) "Air quality" "Atmospheric chemistry", "Hazardous fuels", "Automotive fuels", "Diesel fuels", "Volatile organic compounds", "Hydrocarbons", "Aviation fuels", "Shale", "Fuel additives", "Gasoline", "Combustion products", "Crude oil", "Aerosols", "Environmental impact", "Ozone", "Outdoor Simulation", "Data processing", "Experimental data".

AD-A113 865

## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A113 865 CONTINUED

IDENTIFIERS (U) JP-10 fuel, JP-8 fuel, Ru-5 fuel, Ru-4 fuel, Ru-5  
fuel, Unleaded gasoline, WUFESC10000200, P08001F

OUTDOOR CHAMBER DATA TABULATIONS PART I

DESCRIPTIVE NOTE. Final rept Mar 80-Sep 31.

NOV 81 330p?

PERSONAL AUTHORS Carter, William P. L., Ripley, Paul S.  
Smith, Charles G.; Pitts, James N., Jr.

CONTRACT NO F08035-80-C-C084

PROJECT NO 1200

TASK NO 20

MONITOR AFFSC/ESL  
1R-81-53-V-2-P-1

## UNCLASSIFIED REPORT

## SUPPLEMENTARY NOTE See also Volume 2, Part 2, AD-A113

986

ABSTRACT (U) A total of 132 single and multi-day

outdoor chamber experiments were conducted in this program involving nine different aviation and automotive fuels. These included the petroleum-derived JP-4 and JP-8 aircraft aviation fuels, their marine oil-derived analogs, unleaded gasoline, diverse No. 2 fuel, and the experimental high-energy cruise-missile fuels JP-10, Ru-4, and Ru-5. The program was conducted to assess the potential of these fuels to adversely affect air quality. This is Volume II of the report. Due to printing limitations, Volume II consists of two separately bound parts which contain the detailed data sheets from the outdoor chamber experiments. This is Part 1 of Volume II (author)

DESCRIPTIONS (I) "Air quality" "Atmospheric chemistry", "Hazardous fuels", "Automotive fuels", "Diesel fuels", "Volatile organic compounds", "Hydrocarbons", "Aviation fuels", "Shale", "Fuel additives", "Gasoline", "Combustion products", "Crude oil", "Aerosols", "Environmental impact", "Ozone", "Outdoor Simulation", "Data processing", "Experimental data".

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AD-A113 588	1/5	AD A113 527	8/7
BATTELLE COLUMBUS LABS OH		CIVIL ENGINEERING LAB (NAV) PORT HENNEPEN CA	
(U) BDR Tensile Structure Concept Feasibility Study		(U) Permeability and Strength Characteristics of Graded Crushed Stone for Use in Rapid Runway Repair	
DESCRIPTIVE NOTE Final rept Mar-Jul 80.		DESCRIPTIVE NOTE Final rept Jan-Sep 80.	
AUG 80	4SP	SEP 80	7GP
PERSONAL AUTHORS Kuravetov, Edward N.		PERSONAL AUTHORS Wu, Q. Y.	
CONTRACT NO FCG635-80-C-0109		CONTRACT NO MIPR-S-80 12	
PROJECT NO 2104		PROJECT NO 2054	
TASK NO 2B		TASK NO 6B	
MONITOR AFSC/611		MONITOR ESL	
TR-80-62		TR-80-54	

## UNCLASSIFIED REPORT

**ABSTRACT** (U) This report discusses the feasibility of using a thin-sheet membrane as a bridge across a bomb crater in a runway. The first step of the study was to determine the tension in a membrane required to support an F-4E load. Given the tension forces, membrane thickness was determined. The next step was to determine a feasible system for anchoring a membrane to pavement surrounding the crater. The final part of the study was discussion on membrane fabrication, handling, and installation procedures. (Author)

**DESCRIPTORS** (U) \*Runways, \*Repair, \*Bomb damage, \*Craters, \*Pavements, \*Membranes, Sheets, Thermal stresses, Anchors, Structural, Strain hardening, Tension, Feasibility studies

**IDENTIFIERS** (U) F-4C aircraft KUAF ESC2 1042050  
PEB03723F

## UNCLASSIFIED REPORT

**ABSTRACT** (U) The permeability and strength characteristics of six gradations of crushed limestone were evaluated in the laboratory to identify a gradation of crushed limestone that is stronger than the lysite. Gradation based on limited laboratory tests showed buildup did not seem to be a significant problem associated with the crushed limestone. The frictional strength criterion is not suitable for this crushed limestone because the friction angles obtained from undrained triaxial tests may not be valid within the applied range of confining pressures. With the assumption that strength at low confining pressures is more important than at high confining pressure, the cohesion criterion was selected for analyzing tests. Field traffic tests are needed to validate the assumption. (Author)

**DESCRIPTORS** (U) \*Limestone, \*Runways, \*Highway pavements, Permeability, Shear strength, Physical properties, Pore pressure, Friction, Cohesion, Crushing, Quick reaction, Modulus of elasticity, Computerized simulation, Airports, Field tests, Laboratory tests, Poisson ratio, Finite element analysis

**IDENTIFIERS** (U) PE64703F NUSCL20548817

AD-A113 588  
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AD A113 527  
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AD A113 527  
055026

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DTIC REPORT BIBLIOGRAPHY		SEARCH CONTROL NO. 055028
AD-A112 490	13/12	AD-A112 490 CONTINUED
ANSUL CO MARINETTE WI		
(U) P-13 Dual Agent Application		
DESCRIPTIVE NOTE Final rept Aug 73-Aug 81.		
AUG 61	45P	
PERSONAL AUTHORS McDonald, Lyle, Harro, John,		
PROJECT NO 2505		
TASK NO 10		
MONITOR AFESC/ESL		
TR-A1144		

UNCLASSIFIED REPORT

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ABSTRACT (U): The two separate hose reel assemblies on the AS-32/P-13 were replaced with a single electric rewinding reel containing 100 feet of twinend one inch hose. Agent discharge piping was rerouted to opposite sides of the hose reel and the agents are discharged through a dual agent nozzle assembly capable of being operated usually by one man. The existing two ball valve type nozzle are replaced with a single dual agent nozzle in configuration capable of discharging dry chemical and Halon 1211. A standard electric reel and twinend hose reel was installed with a lever to routing the harness route. power requirements and operation. The electrical and requirements are within the present capability of the vehicle, and harness routing follows current vehicle specifications to prevent chafing, weathering and other damage. The operating controls have been located to allow one man to energize the reel and chemicals and also guide the hose onto the reel. The actuation systems of both units are designed to facilitate a one-person operation (recoiling of one lever opens all valves). This actuation lever is located at the rear of the vehicle in the vicinity of the dual agent nozzle. A provision was incorporated into the system to clear agents from the hose after use. The dispensing system satisfies the flight and taxiing load requirements of MIL-A-421. The modified components of the vehicle can be discharged independently and simultaneously from their respective nozzles to insure satisfactory operation and conformance to the P-13 requirements.

AP-A112 490

UNCLASSIFIED

DISPENSERS (U) Dispensers, Fire extinguishing agents, Fire fighting vehicles, Landing fields, Airports, Houses, Dual mode, Modular, Dry chemicals, Chemicals, Potassium carbonate, Bicarbonates, Halogenated hydrocarbons  
IDENTIFIERS (U) AS-32/P-13 vehicles, Halon 1211, PKP (Potassium bicarbonate), PGS4708R, MUFSC25051002

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DTIC REPORT LIBRARY

AD-A111 493 1/8 13/2 1/3

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFS FL  
ENGINEERING AND SERVICES LAB

(U) Proposed Specifications for International  
Interoperability on Repaired Bomb Damaged Runways

DESCRIPTIVE NOTE Final rept Jun 80 Jan 81.

JAN 81

60P

PERSONAL AUTHORS CATCHALL, LAPISTY R , GARDNER, ANTHONY G

PROJECT NO AFESC-ESL-1-R-81-03

REPORT NO AFESC-ESL-1-R-81-03

PROJECT NO 2104

TASK NO 28

PERSONAL AUTHOR: Jabolonski, Edwin J.

PROJECT NO: 2503

TASK NO: 10

MONITOR AFESC/ESL

TR-81-18

519

UNCLASSIFIED REPORT

ABSTRACT (U) This paper suggests definitions for data, data formats, and National responsibility for development of war emergency airfield pavement repair specifications. An airfield manager would use these specifications to make repairs after an enemy attack. Minimum operating strip size, repair quality, repair spacing, and other parameters are specified. If the repair specifications for a specific aircraft can not be met, then discrepancies can be identified and the aircraft operator could discuss the additional risk. Exchange of these specifications between the nation operating an aircraft and the nation managing an airfield would enhance NATO interoperability. (Author)

DESCRIPTORS (U) Runways, Western Europe, Military facilities, Operation, Military requirements, Bomb damage, Repair, Taxways, Jet fighters, Specifications, International

IDENTIFIERS (U) F-4E aircraft, WUESL21042841, PEG63723F

UNCLASSIFIED

DTIC REPORT LIBRARY

SEARCH CONTROL NO 059028

AD-A110 821

NAVAL RESEARCH LAB WASHINGTON DC

(U) Evaluation of Thinner Percent Aquacous Film Forming Form (AFFF) Concentrates as Fire Fighting Agents

DESCRIPTIVE NOTE Final rept Sep 78-Navy 80.

APR 81

4SP

UNCLASSIFIED REPORT

ABSTRACT (U) A large-scale fire test program involving 20,000-square-foot drop 4 fuel fires was conducted to evaluate the fire suppression effectiveness and compatibility of 3 percent aqueous film forming foam (AFFF) agents on aircraft fire fighting vehicles. Three commercially available 3 percent AFFF concentrates were tested in accordance with military specification MIL-F-24358. Test results are summarized in Appendix A. As a result of these tests, an update to Revision C to this MIL SPEC has been accomplished with new requirements for both 3 percent and 9 percent AFFF fighting agents. (Author)

DESCRIPTORS (U) \*Fire extinguishing agents, \*fire suppression, Nozzles, Foam, Forming inhibitors, Military Concentration, Specifications, Fuel and aviation Concentration (Chemistry), Military vehicles, Fire fighting vehicles

IDENTIFIERS (U) Fuel fires, Air Force fire fighting vehicles, AFFF (Aqueous Film Forming Foam), WURESC250510, PEG64708F

AD-A111 493

AD A110 821

PAGE 24 055023

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DTIC REPORT EPIGRAPHY			
AD-A110 758	0/0	13/2	20/4
AIR FORCE ENGINEERING AND SERVICES CENTER		TYNDALL AFB FL	
ENGINEERING AND SERVICES LAB			
(U) The Biological Degradation of Spilled Jet Fuels. A Literature Review			
DESCRIPTIVE NOTE Final rept Jun Aug 81.			
OCT 01	41P		
PERSONAL AUTHORS Carlson, Robert E.			
REPORT NO AFESC/2SL/TR-81-50			
PROJECT NO 18100			
TASK NO 20			
UNCLASSIFIED REPORT			

520

ABSTRACT. (U) Biodegradation of many of the components of Air Force fuels does occur, although most studies have been done under laboratory conditions, and the extrapolation of the findings to natural rates of biodegradation is premature. Many factors affect biodegradation rates, including the nature and concentration of the specific hydrocarbon compound, the species of bacteria present and their viability, and environmental factors such as nutrient availability, temperature, and oxygen concentration. Initial concerns should be first the determination of the importance of biodegradation relative to other loss factors such as volatilization and sediment sorption, and second, the determination of the ultimate fate of nondegradable compounds and their metabolites (Author).

DESCRIPTORS. (U) \*Biodegradation, Jet engine fuels, Water pollution, Microorganisms, Bacteria, Bacteria, Decomposition, Hydrocarbons, Metabolism, Rates, Toxicity, Ecosystems, Pollutants, Spilling, Concentration(Composition), Gullies(Biology), Aquatic organisms, Water pollution sediment

IDENTIFIERS (U) JP-4 fuel, MUAFESC19002034, PEB2801F

AD-A110 758

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## DTIC CONTROL NO 055028

AD-A110 072 13/2

NEW MEXICO ENGINEERING RESEARCH INST ALBUQUERQUE

(U) Bomb Damage Repair Code for Prediction of Repaired Crater Performance

DESCRIPTIVE NOTE Final rept: 27 Sep 78-30 Sep 80.

SEP 80

PERSONAL AUTHORS Baird, Glenn T.

REPORT NO NMER1-AP-36

CONTRACT NO F20001-78-C-0015

PROJECT NO 2104

TASK NO 28

MONITOR AFESC/ESL  
TR-80-89

## UNCLASSIFIED REPORT

ABSTRACT. (U) A nonlinear finite-element computer code has developed for use in predicting the performance of repaired bomb craters. The code is capable of calculating the stresses, strains, and deflections produced by single- and multiple-wheel aircraft gear configurations. The apparent crater profile can be input as a series of linear approximations that is used by the code to predict material properties to reflect pushback and fallback crater debris from in situ native materials (Author).

DESCRIPTORS (U) \*Craters, \*Bomb damage, Pavements, Repair, Profiles, Debris, Launch Gear, Stress, Strain, Mechanics, Deformation, Mathematical prediction, finite element analysis, Computerized simulation, Computer programs

IDENTIFIERS (U) Bomb damage repair, MUAFESC2 1042847, PEB03723F

AD-A110 872

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DTIC REPORT BIBLIOGRAPHY

AD A110 835	13/2	21/9	SEARCH CONTROL NO	055028
ENGINEERING-SCIENCE CO	MCLEAN, VA	1/3	AD A110 305	21/4
(U) Air Pollution Testing of Hypersonic Fuel Vapor Scrubbers at Cape Canaveral Air Force Station Florida			AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL	
(U) Aircraft Fuel Jetsoning			ENGINEERING AND SERVICES LAB	
DESCRIPTIVE NOTE Final rept Jul-Nov 60.			(U) The Effect of Fuel Composition on Groundfall from	
OCT 61	52P	MAR 81	DESCRIPTIVE NOTE	Final rept Mar 80-Fab 81.
PERSONAL AUTHORS Felts N Keith.			PERSONAL AUTHORS	Clewell, Harvey J., III.
REPORT NO	3725 00/20	REPORT NO	AFESC/ESL-TR-61-13	
CONTRACT NO	F33615 60-7-4001	PROJECT NO	'1900	
PROJECT NO	1800	TASK NO	AC	
TASK NO	70	UNCLASSIFIED REPORT		
MONITOR	AFESC/ESL TR-7-58	UNCLASSIFIED REPORT		

ABSTRACT (U) Hypersonic fuel and oxidizer scrubbers were studied to determine emissions produced during actual hypersonic transfers. Scrubber liquor used in the fuel scrubber was 14 percent citric acid and the scrubber liquor in the oxidizer scrubber was 5 percent NaOH 12 percent Na2S03 (Author)

DESCRIPTIONS (U) \*Scrubbers\*, \*Hypersonic fuels\*, \*Air pollution, pollution abatement\*, \*Emission control\*, \*Vapors, hydrolyzed hydrazines, Nitrogen oxides, Rocket fuels\*, \*Testers, metalloces, Transient Storage tanks\*, \*Contraction(Contraction), Sampling\*, \*Chemical analysis\*, \*Efficiency\*

IDENTIFIERS (U) WUAFESC190001002, PER8001

IDENTIFIERS (U) Computer models, Fuel Jumping WUAFESC10000C02, PER8261F

IDENTIFIERS (U) Computer models, Fuel Jumping

AD A110 035

AD A110 305

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 056028

AD-A110 307 214 4/1 1/3

CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN IL

AIR FORCE ENGINEERING AND SERVICES CENTER YNDALL AFB FL

(U) Pavement Maintenance Management: for Roads and Parking Lots

DESCRIPTIVE NOTE Final rept Oct 78-Dec 79.

OCT 81 223P SFP 80 131P

PERSONAL AUTHORS Shantin, Mohamed Y , Kohn, Starr D

PERSONAL AUTHORS Clewell, Harvey J , III ,

REPORT NO CERL-TR-A-284 REPORT NO AFESC/CSL-TR-80-58

PROJECT NO 4A702721A741, 2054 PROJECT NO 1000

TASK NO D, 4P TASK NO 4C

MONITOR APESC/ESL UNCLASSIFIED REPORT

REPORT NO (PR-80-58)

## UNCLASSIFIED REPORT

ABSTRACT (U) This report describes PAVER, a field-tester, validated pavement maintenance system for military installations which is designed to optimize the funds allocated for pavement maintenance and rehabilitation (M&R) (Author)

DESCRIPTORS (U) Pavements, Maintenance management, Military facilities, Paving, Surveys, Ratings, Maintenance, Rehabilitation, Repair, Economic analysis, Data management, Manual operation, Computer applications

IDENTIFIERS (U) Parking facilities, PAVER management system, MU040 PE0221A, AS21

ABSTRACT (U) An experimental and modeling effort was undertaken to determine the physical rate of JP-4 jet fuel discharged from an aircraft in flight. A computer model was developed to simulate evaporation and free-fall of fuel droplets in the atmosphere. In order to apply this model to jetsonned fuel, an experimental study was performed to determine the droplet size distribution produced by the jetsonning process. This study featured in-flight sampling of the fuel plume from KC 135 tanker aircraft. Sampling was also performed at ground level to determine whether the jetsonned fuel reached the ground in significant concentrations. Fuel jetsonning as low as 750 meters above the ground at temperature turns around 11 C. No liquid fuel could be detected by ground observers and no significant hydrocarbon concentrations (greater than a few ppm C) were measured by the sampling

DESCRIPTORS (U) Jet engine fuels, Jetsonning equipment, "Drops, E-sporation, Distribution, Particle size, Tanker aircraft, Experimental data, Diversions, Computerized simulation, Flight, Ground level, Sampling Hydrocarbons, Vapors

IDENTIFIERS (U) JP-4 fuel, KC-135 aircraft, Fuel jetsonning, Groundfall, Fuel dumping, PE0280ff WAFESCS1900C02

## UNCLASSIFIED

NYIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 054028  
 AD-A108 268 1/5 19/4 14/5 9/2 AD A108 288 CONTINUED  
 NEW MEXICO ENGINEERING RESEARCH INST ALBUQUERQUE  
 Pavement Doses, Infrared photography  
 IDENTIFIERS (U) MILARES2:1042324, PE03723F  
 (U) Pavement Assessment Volume 1 Methodology for  
 Selecting Repair Area of Ordnance-Damaged Pavements  
 DESCRIPTIVE NOTE Final rep1 1 Jun 77-31 Aug 78  
 SEP 20 121P  
 PERSONAL AUTHORS Wilson Christopher W. Williams, Neil D.  
 REPORT N<sup>o</sup> NMERI-AP-28-VOL-1  
 CONTRACT NO F28001-76 C-0015  
 PROJECT NO 2104  
 TASK NO 28  
 MONITOR AFSC/ES2  
 TR 80-77-VIL-1

## UNCLASSIFIED REPORT

ABSTRACT (U) This report introduces and provides detailed information on fair damage assessment and data reduction systems. The functions of these systems are to locate and assess the magnitude and location of the damage sustained by an airbase pavement during an attack using conventional weapons and to select the section of the runway requiring the least amount of repair time to the runway. The primary system utilizes a linear photodiode array camera (1728 elements) to scan the runway and microcomputer and video processing equipment to reduce the data and select the repair area. Three backup systems are recommended which require more time to assess the damage and reduce the data. Recommendations are made by the New Mexico Engineering Research Institute (NMERI) for the development of the four systems. This report is Volume 1 of two volumes (Author)

DESCRIPTORS (U) "Runway" "Damage assessment", "Bomb damage", "Craters", "Video mapping", "Image processing", "Linear array Photodiodes", "Electronic scanners", "Video signals", "Display systems", "Microcomputers", "Data processing", "Data reduction", "Aerial reconnaissance", "Photogrammetry", "Quick reaction", "Repair", "Aerial cameras", "Site Selection

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AD A108 488

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## UNCLASSIFIED

AD-A108 19B 11/7 5/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
 NEW MEXICO ENGINEERING RESEARCH INST ALBUQUERQUE AD-A107 712 1/5  
 (U) Asphalt Recycling Technology Literature Review and  
 Research Plan  
 DESCRIPTIVE NOTE Final rept 20 Sep 80 13 Apr 81.  
 '80A 21 1/2P  
 PERSONAL AUTHORS Newcomer, David F. Epps, John A.  
 REPORT NO NMERI-2 10 APR-80  
 CONTRACT NO F2/801-78-C-0015  
 PRODUCT NO 2104  
 TASK NO 19  
 MONITOR AFESC/ESL TR-80-47  
 1/2P  
 PERSONAL AUTHORS Newcomer, David F. Epps, John A.  
 REPORT NO NMERI-2 10 APR-80  
 CONTRACT NO F2/801-78-C-0015  
 PROJECT NO 2104  
 TASK NO 2B  
 MONITOR AFESC/ESL TR-80-47 VOL-2

## UNCLASSIFIED REPORT

ABSTRACT (U) A review of current technology for the rehabilitation and maintenance of pavement surfaces by recycling was conducted while the primary concern was asphalt concrete recycling. A brief review of pertinent current concerns resulting in a detailed report of various recycling technology and lessons learned are involved. Recommendations are presented outlining research required to advance the state-of-the-art in a manner that will permit the U.S. Air Force to fully utilize the benefits of recycling technology. (Author)

DESCRIPTIONS (U) Asphalt, \*recycled materials, Literature surveys, State of the art, Air Force, Components, Concrete, Pavements, Surfaces, Plastics, Research, Management, Benefits, Rehabilitation, Case studies, Experimental design, Maintenance

IDENTIFIERS (U) Pavement design, UNAFESC21041A03, DTIC 07237

## UNCLASSIFIED REPORT

ABSTRACT (U) This report describes the damage assessment system for rapid runway repair developed for concept verification. In the damage assessment system, an airborne linear Charged Coupled Device array and an interactive image processing system are used to locate, size, and classify damages. The repair area is selected by an operator. Results of the testing, the tradeoff analysis, and the field demonstration are presented. Recommendations are made for the development of a prototype system. (Author)

DESCRIPTIONS (U) Runways, \*Quick reaction, \*Repair, \*Damage assessment, Research management, Test methods, Trade off analysis, Prototypes, Field conditions, Demonstrations, Classification

IDENTIFIERS (U) UNAFESC21042B2, PE837231

## UNCLASSIFIED

AB-A107 877 1/5 20/11  
 ROSS FRAZERING ASSOCIATES INC VALPARAISO FL  
 (U) FO Cover Analysis for Rapid Runway Repair  
 DESCRIPTIVE NOTE Final report 30 Jun-30 Sep 60.  
 OCPY 80 ABP  
 PERSONAL AUTHORS ROSS, C. A.  
 CONTRACT NO FOR0035-80 M-0248  
 PRODUCT NO 2054  
 TASK NO 6B  
 MONITOR AFESC/ESI  
 TR-AD-5B

## UNCLASSIFIED BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD A107 552 13/8

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
 ENGINEERING AND SERVICES LAB(U) Method and Technologies for Reducing the Generation of  
 Hail-Bearing Sludges at AFSC Industrial Waste  
 Treatment Plants

DESCRIPTIVE NOTE Final report Jun 78-May 81.

AUG 81 126P

PERSONAL AUTHORS Wachinski, Anthony M.

REPORT NO AFESC/ESI-TR-81-28

PROJECT NO 2103

TASK NO 70

## UNCLASSIFIED REPORT

ABSTRACT (U) This study is concerned with the response of FOU covers for rapid runway repair. The major portion of the work is in support of the North Field tests. In addition some new repair materials and methods are discussed. (Author)

DESCRIPTORS (U) Runways, Quick reaction, Repair, Strips, Gravel relations, Field tests, Materials, Methodology, Coverings, Hail, High temperature, Concrete, Polymers, Flexible structures, Loads, Forces

IDENTIFIERS (U) Pod covers, Post service tests, Jet blast analysis, WMAFESCI048B18, PEB108F

ABSTRACT (U) At present, the Air Force provides maintenance for its inventory of aircraft and associated systems at five industrial-complexes called Air Logistic Centers (ALCs). Wastewaters generated at the ALCs are treated by industrial waste treatment plants located on site. The effluent is then discharged to a nearby stream or to a privately owned Treatment Works (PTW). During the period 16 July 1978 to 3 May 1980, there were surveyed for ways to reduce the volume of metal-bearing sludges generated by the PTWs. Results of the surveys showed that the volume of sludge could be significantly reduced by a coordinated program of wastewater reduction, plating chemicals conservation, evaporation, ion exchange, and reverse osmosis and their application as recovery processes in Air Force electropolishing operations. (Author)

DESCRIPTORS (U) Industrial plants, Waste treatment, Electropolishing, Sludge, Volume, Bearing, Metals, Processing, Toxic agents, Reverse osmosis, Waste water Optimization, Electropolishing, Aircraft, Air Force operations, evaporation, Ion exchange.

AD A107 552

AB A107 877

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## UNCLASSIFIED

AD-A107 552 CONTINUED  
 Reduction(Chemistry)

IDENTIFIERS (U) ~~KAJAFESC21037005, PEG3723F~~

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A104 447 13/2 11/2 11/0

TEXAS UNIV AT AUSTIN

(U) Methyl Methacrylate Polymer-Concrete for Bomb Damage Repair Phase I

DESCRIPTIVE NOTE Interim rept Mar 73-Key 80.

JUN 80 85P

PERSONAL AUTHORS fowler, David W., Paul, Donald R., McCullough, B. F., Meyer, Alvin H.

CONTRACT NO 7008135 79-C-0103

PROJECT NO 2104

TASK NO 20

MONITOR AFESC/ESI

TR-AD-28

## UNCLASSIFIED REPORT

ABSTRACT (U) Methyl methacrylate (MMA) polymer concrete appears to be a material which can be successfully used to rapidly bond damaged runways. A research program is underway to develop monomer formulations, determine bonding, dosing properties, develop repair procedures, conduct limit tests, conduct analytical studies, and develop an implementation manual. Research in Phase I has emphasized materials characterization, development of preliminary repair procedures, and analytical and experimental behavior of repair materials. Material characterization studies of polymer-concrete monomer formulations and polymer-concrete mechanical properties for a wide range of ambient temperatures. Possible solutions for reducing adverse effects on strength of polymer-concrete made with wet aggregate have been studied. The effect of MMA on bond to asphalt has been determined. The effect of aggregate size on mechanical properties has been investigated.

DESCRIPTORS (U) "Concrete," "Polymers," Runways, Bomb Repair, Cracks, Methacrylates, Methyl radicals, Monomers

IDENTIFIERS (U) "Polymer concrete, Bomb damage repair, Aggregates (Materials), Methyl methacrylate,"

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AD-A104 447 CONTINUED  
WUAFESC2 10/28/35. PEG37231

## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055020

AD-A103 907 1/2 13/12

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

(U) Test and Evaluation of Commercially Available Halon  
1211 Hand Portable Fire Extinguishers for Use in  
Habitable and Cargo Compartments of USAF Aircraft

DESCRIPTIVE NOTE Final rept Aug 80 Feb 81.

MAY 81 10SP

PERSONAL AUTHORS Walker, Joseph L. Vickers, Richard N.  
Koen, Anthony J.

REPORT NO AFESC/ESI-TR-81-22

PROJECT NO 2505

TASK NO 10

## UNCLASSIFIED REPORT

## ABSTRACT

(U) This report describes the results of a test and evaluation program of commercially available, off-the-shelf Halon 1211 hand portable fire extinguishers. The primary emphasis of the test program was aimed at establishing the flightworthiness/crashworthiness characteristics of candidate articles. Tests were also conducted to evaluate the test item's design features, function, operational capabilities and maintainability. Results of this test program will be used in establishing procurement specifications for Halon 1211 first-aid hand-portable fire extinguishers for use on board USAF aircraft. (Author)

DESCRIPTORS (U) Fire extinguishers. Fire  
extinguishing agents. Test and evaluation. Military  
aircraft. Tetrafluorohydrazine. Ustins. Commercial  
equipment. Procurement. Specifications. Maintainability  
Portable equipment. Compartments. Cargo. Humans. Aviation  
safety

IDENTIFIERS (U) HALON-1211 PEG4708F. WUAFESC25051013

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A102 013 CONTINUED

IAC NO PL 040332

DOCUMENT TYPE PLASTIC - MICROFICHE --

IAC SUBJECT TERMS P-(U) Polymer concrete, Repair, Runways, Airfields, Field repairs, Limestone, Pavements, Landing mats, Fiberglass/polyester, Polyesters, Composites, Fiberglass/polyurethane, Polyurethanes, Failure criteria, Membranes, Moisture content, Damage, Formulations, 22, Unlimited;

(U) Field Test of Expedient Pavement Repairs (Test Items 10-3B)

DESCRIPTIVE NOTE Final rept Jul 78-Sep 79.

NOV 80 112P

PERSONAL AUTHORS MacNorrey, Michael T

REPORT NO AFESC/ESL-TR-80 51

PROJECT NO 2104

TASK NO 28

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE Smo 4140 Rept no AFESC/ESL-TR-79 00 dated Mar 80. AD-A044 778

ABSTRACT (U) This report describes /ivid tests of 19 repairs that showed potential for use in temporary expedient repair of bomb craters in runways. The test facility consisted of a concrete surface placed over a crushed limestone base which in turn lay over a weak clay subgrade. Three 20-foot by 20-foot square sections were left open in the concrete to serve as test pits. The test facility was constructed to allow instrumentation of said: bomb craters in a typical North Atlantic Treaty Organization runway. The test materials were used to repair the craters in the pavement. Upon completion of each repair, the resulting surface was tested with load carts constructed to give the same load that would be experienced from landing of a modern fighter aircraft or cargo aircraft. This report describes the result of each of the tests and identifies areas requiring further research. (Author)

KEYSCRIPTORS (U) Pavements, Repair, Runways, Concrete, Crater, Simulation, Pavement bases, Limestone, Polymers, Performance tests, Loads (forces), Failure(Mechanics)

IDENTIFIERS (U) Expedient surfacing polymer concrete  
MIAFES22 1042822 PES9373F

AD-A102 903

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DTIC REPORT BIMILOGRAPHY

SEARCH CONTROL NO 050028

AD A102 048

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AD-A102 640 10/7 8/7 SANDIA NATIONAL LABS ALBUQUERQUE NM AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL

(U) Geothermal Resource Verification for Air Force Bases.

JRN 81 53P

PERSONAL AUTHORS Grant, Philip R., Jr.

REPORT NO SARD81-7123

CONTRACT NO DE-AC04-76DP00760

PROJECT NO 20d4

UNCLASSIFIED REPORT

DTIC REPORT BIMILOGRAPHY

SEARCH CONTROL NO 050028

AD A102 048

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19/1

(U) Expected Results from Napalm Type Weapons on Asphalt Pavements

DTIC REPORT BIMILOGRAPHY

SEARCH CONTROL NO 050028

AD A102 048

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19/1

(U) Expected Results from Napalm Type Weapons on Asphalt Pavements

DTIC REPORT BIMILOGRAPHY

SEARCH CONTROL NO 050028

AD A102 048

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19/1

(U) Expected Results from Napalm Type Weapons on Asphalt Pavements

DTIC REPORT BIMILOGRAPHY

SEARCH CONTROL NO 050028

AD A102 048

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19/1

(U) Expected Results from Napalm Type Weapons on Asphalt Pavements

DTIC REPORT BIMILOGRAPHY

SEARCH CONTROL NO 050028

AD A102 048

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(U) Expected Results from Napalm Type Weapons on Asphalt Pavements

DTIC REPORT BIMILOGRAPHY

SEARCH CONTROL NO 050028

AD A102 048

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(U) Expected Results from Napalm Type Weapons on Asphalt Pavements

DTIC REPORT BIMILOGRAPHY

SEARCH CONTROL NO 050028

AD A102 048

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(U) Expected Results from Napalm Type Weapons on Asphalt Pavements

DTIC REPORT BIMILOGRAPHY

SEARCH CONTROL NO 050028

AD A102 048

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19/1

(U) Expected Results from Napalm Type Weapons on Asphalt Pavements

DTIC REPORT BIMILOGRAPHY

SEARCH CONTROL NO 050028

AD A102 048

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19/1

(U) Expected Results from Napalm Type Weapons on Asphalt Pavements

DTIC REPORT BIMILOGRAPHY

SEARCH CONTROL NO 050028

AD A102 048

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19/1

**ABSTRACT** (U) Geothermal energy offers a potential alternative to oil and gas for supplying the stationary energy requirements of military installations. However, because of the past dominance of oil and gas procedures for extracting geothermal energy, potential have not been well defined nor well tested. A report summarizes the various types of geothermal energy, reviews some legal uncertainties of the resource and then describes a methodology to evaluate geothermal resources for applications to U.S. Air Force bases. Estimates suggest that exploration costs will be \$80-300,000, which, if favorable, would lead to drilling a 1500-0000 exploration well. Successful钻孔 and development of a geothermal resource could provide all base fixed system needs with an inexpensive, renewable energy source. (Author)

**DESCRIPTORS** (U) Geothermey, Air Force facilities, Cost estimates, Geophysical prospecting, Drilling, Potential energy, Natural resources, Energy conversion, Energy consumption

**IDENTIFIERS** (U) Geothermal energy, Renewable resources  
PE64703F

## UNCLASSIFIED

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AD-A101 444

8/5

ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT  
NEUILLY-SUR-SEINE (FRANCE)(U) Advanced Operational Aviation Medicine Course (8th).  
Held at Centre de Recherche Aeronautique, Brussels,  
Belgium, 24-28 March 1980.

MAY 81

100P

PERSONAL AUTHORS

Gande, J.

REPORT NO

AGARD-R-081

## UNCLASSIFIED REPORT

## SUPPLEMENTARY NOTE. Text in English and French

**ABSTRACT.** (U) This report contains most of the lectures delivered to the course participants. It dealt with the cardiological problems of selection and screening, the epidemiology and prevention aspects and the problems of ageing. Special emphasis was placed on the cardiovascular problems and follow-up of pilots of the new generation high performance aircraft. The course was conducted under the auspices of the Aerospace Medical Panel of AGARD (Author)

**DESCRIPTORS** (U) "Aviation medicine," "Cardiovascular diseases," "Aging (physiology)," Reports, Epidemiology, Selection, Preventive medicine, NATO, Pilots

530

## SEARCH CONTROL NO

050028

AD-A100 680

1/5

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB(U) Environmental Effects and Treatment Alternatives for  
Uranium Runoff from Airfield De-Iicing Operations

DESCRIPTIVE NOTE. Final rept Jan 79 Jul 80.

AUG 10  
40P

PERSONAL AUTHORS

Blum, Robert Q.

REPORT NO

AFESC/CSL TR-80-40

PROJECT NO

1600

TASK NO

7C

## UNCLASSIFIED REPORT

**ABSTRACT** (U) A literature review is presented which covers chemical transformation of urea, aquatic toxicity, nitrogenous oxygen demand and entrainment. Several feasible control technologies for urea runoff are evaluated, including source control, land application, trickling filter, breakpoint chlorination, and ammonia stripping (Author)

**DESCRIPTORS** (U) "Landfill fields," "Ditching systems," "Urea," "Runoff," "Environmental impact statements," "Toxic agents," "Literature surveys," "Pollution abatement," "Oxygen consumption," "Nitrogen," "Toxic agents," "Dissolved oxygen," "Water," "Runoff," "Environmental impact statements," "Toxic agents," "Literature surveys," "Pollution abatement," "Oxygen consumption," "Nitrogen," "Toxic agents," "Dissolved oxygen," "Water," (Author)

**IDENTIFIERS** (U) Nitrogenous oxygen demand, Trickling filter's, Breakpoint chlorination, Ammonia stripping  
WUAFESC16007008, PF62801F

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SEARCH CONTROL NO US91026  
AD-A100 825 21/4 21/2 21/5  
AEROCHEM RESEARCH LABS INC PRINCETON NJ  
(U) Correlation of Soot Formation in Turbojet Engines and  
in Laboratory Flames  
CONFIDENTIAL  
AO A100 825 CORRELATION  
COMPOUNDS, HYDROCARBONS, SMOKE, PARAFFINS, CORRELATION  
TECHNIQUES  
IDENTIFIERS (U) Engine service number 1692801F.  
WAFFSC19002051

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WELFARE ANALYSIS

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CONTRACT NO. 443

PROJECT NO 1800

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**ABSTRACT.** (1) Data obtained from aviation gas turbine combustor tests have been examined to determine the effects of fuel properties on soot-related measurements such as engine smoke number, combustor flame radiation, and/or combustor linear temperature. Some tests of smaller laboratory combustors used to simulate the existing large combustors were also examined. From the existing data it is clear that soot production is a strong function of the fuel chemical composition. Variations in the physical properties of the fuel do not correlate well with soot-related effects. In studies in which a broad range of fuel properties was examined, correlation of soot-related effects with basic fuel composition parameters including (1) the hydrogen content of the fuel, (2) the aromatic content of the fuel, and (3) the amount of multiple-ring aromatics in the fuel show that typically only the first of these correlates well; however, it has also been shown that fuel compositions can be chosen for which this correlating parameter fails.

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AD-A100 489	21/4	AD-A100 489	CONTINUED
SOUTHERN RESEARCH INST	SAN ANTONIO TX MOBILE ENERGY DIV	exhaust smoke (Author)	
(U) Fuel Micromulsions for Jet Engine Smoke Reduction	Final rept 4 Jul 70-15 Mar 80.	Descriptors (U) Jet engine fuels, "Smoke abatement, Fuel additives, Carbinols, Ethanol, Water, Fuels substances, Test methods, Synergism, Smoke, Soot	
DESCRIPTIVE NOTE	MAY 80	Identifiers (U) Micromulsions, JP-4 fuel, JP-8 fuel PER1102F, MAFESCLTR705	
PERSONAL AUTHORS	Nagel, D. W., Fodor, G. E., Moses, C. A		
REPORT NO	SMR-MED116		
CONTRACT NO	FOR8058-79 C-0213		
PROJECT NO	ILTR		
TASK NO	70		
MONITOR	AFESC/ESL		
	TR-80-25		

## UNCLASSIFIED REPORT

ABSTRACT (U) The concept of water and alcohol/fuel microemulsions for the purpose of reducing smoke emissions from jet engine test cells was studied in a T-03 gas turbine combustor. Several ethanol/fuel, methanol/fuel, and water/fuel microemulsions were prepared with JP-4 and JP-8 base fuels and the appropriate surfactants (both metallic (ferricene) and nonmetallic (hydrazine)) smoke-reducing additives were examined for possible synergistic effects when combined with the microemulsified fuels. The fuels were tested at the takeoff, climb, cruise and ground idle operating condition, and the exhaust smoke, flame radiation and gaseous emissions were measured. The exhaust smoke and flame radiation were significantly reduced by the addition of alcohol and water to the base fuel. Ethanol was found to be most cost effective because it required the least amount of surfactant, which was the most expensive fuel component. The tendency of the microemulsions to form soot was found to correlate with  $N/C$  ratio in the same way as typical petroleum-base fuels. Ferricene, which is well known for its ability to reduce exhaust smoke, had the same effect on the microemulsions as the base fuels. It did not affect flame radiation. Hydrazine was not an effective additive for reducing

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UNCLASSIFIED REPORT

**ABSTRACT.** (U) The development of a methodology for derivation of non-potable reuse water quality criteria by dividing into the segments: Determination of the specific contaminant which is likely to have a significant dose of a toxic effect, and Estimating the processes no adverse health effects, and Estimating the daily concentration of contaminant in the recycled/reused water which would cause the subject the total exposure received allowable dose, during a certain time period. A first requirement is to assemble an adequate data base defining toxic effects, to account the subjects to develop an adequate data to describe the methodology proposed to recycle/reuse water. The methodology proposed in this report is intended to serve as a set of guidelines for the development of non-potable water quality criteria.

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				DTIC REPORT BIBLIOGRAPHY	SEARCH CONTROL NO	055028
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MASSACHUSETTS INST OF TECH LEXINGTON LINCOLN LAB				AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL		
(U) Remote Sensing for Turbine Engine Gases				ENGINEERING AND SERVICES LAB		
DESCRIPTIVE NOTE Final rept 1 Oct 79-30 Sep 80.				(U) Protective Coatings for Steel Structures: Laboratory and Field Evaluation and Development of a Model Coating Guide Specification		
SEP 80	51P			DESCRIPTIVE NOTE	Final rept	Jun 77-Jan 80.
PERSONAL AUTHOR	Killingger, Dennis K.	Manyuk, Norman		JAN 80	104P	
HOOFMAN, Aram				A, Post M A		
CONTRACT NO	F19628 80-C-0002			PERSONAL AUTHOR	Campbell, P G	Sleator, J F
PROJECT NO	1900			REPORT NO	AFESC/ESL-TR-80-20	
MONITOR	ESD-AFESC/ESL			PROJECT NO	14	
	TR-81-41, FR-81-18			TASK NO	5C	

## UNCLASSIFIED REPORT

**ABSTRACT.** (U) This is the FY 80 final report for a laser remote sensing program designed to investigate remote sensing techniques on the detection of jet aircraft exhaust gases. The specific tasks which were performed consisted of the following: (1) continuation of feasibility demonstration of CO2 TEA laser remote sensing system and the detection of NO and C2H4 in the atmosphere, (2) continuation of laboratory absorption measurements of CO, NO, and C2H4, (3) initial laboratory investigation of suitability of laser remote sensing of hydrazine, UNNH, and UNH, (4) implementation of digital data acquisition and processing system, and (5) preliminary development of dual-laser DIAL system. (Author)

**DESCRIPTORS.** (U) \*TEA lasers, \*Carbon dioxide lasers, \*Remote detectors, \*Jet engine exhaust, \*Atmospheric chemistry, Jet engines, Gas turbines, Carbon monoxide, Nitrous oxide, Ethylamine, Hydrazine, Methyl hydrazines, Monitoring, Measurement, Absorption, Concentration(Chemistry), Transmittance, Laboratory tests, Data acquisition, Digital systems, IDENTIFIERS (U) FEG2801F

## UNCLASSIFIED REPORT

**ABSTRACT.** (U) The effectiveness and durability characteristics of ten specially selected coating systems were evaluated using laboratory and outdoor exposure testing techniques. Test emphasis was placed on testing combinations of 'testing' materials that could protect high value steel structures. Additional to the author's own written a model cost/benefit specification. This specification, when combined with a special paint Inspector's Guide that was also developed as a part of this project, will help coatings specifiers select proper coating systems based on the existing nature and condition of the surface to be coated. The Paint Inspector's Guide is included as Appendix A to this report. It can be used by paint inspector's to help characterize paint failures and to advise paint inspectors when overseeing painting applications. (Author)

**DESCRIPTORS** (U): \*Steel, \*protective coatings, (corrosion resistance, Structural steel), Structural members, Specifications, Standards, Inspection, Quality Control, Outdoor, Exposure (General), Weathering, Salt spray tests, F-6121 (tests, Paints, IDENTIFIERS (U) WUAFESC21045C02, PR03723F

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SEARCH CONTROL NO 050528  
AC ADP 514 6/20 21/4 21/5 1  
OREGON STATE UNIV CORVALLIS DEPT OF CIVIL ENGINEERING  
(U) Bacterial Toxicity and Metabolism of Three Hydrazine  
Fuels

DESCRITIVE NOTE Final rept 10 Jun 78-15 Aug 79.

SEP 60 11TP

PERSONAL AUTHORS Kane, Donald A.; Williamson, Kenneth J.

CONTRACT NO 208037-78-H-0863

PROJECT ID 2 103

TASK NO 7W

MONITOR AFSC/SES, ATIS  
TR-80-48, CI-80 613D

UNCLASSIFIED REPORT

ABSTRACT (U) Hydrazine based fuels are used for Titan and Minuteman missiles and the F-10 aircraft and by the Space Shuttle program. These fuels represent a significant production, transportation, and storage of these fuels, and, as such, a serious threat to the aquatic environment from the potential for accidental release. This research sought to determine the toxicity of hydrazine (HN), monomethyl hydrazine (MMH), and unsymmetrical dimethyl hydrazine (UDMH) to four enriched bacterial cultures Nitrobacter, Nitromonas, Nitrospina, and Nitrospina. In addition, the toxicity of hydrazine to Nitrobacter was examined. The toxicity studies used batch bioassay methods with response measured in terms of substrate metabolism rates. Results showed that hydrazine produced a 50% reduction in metabolism rate for Nitrobacter, Nitromonas, Nitrospina, and Nitrospina bacteria at concentrations of about 15, 105, 100 and 100 milligram per liter, respectively, monomethyl hydrazine at 15, <1, 15 and 10 milligram per liter, respectively, and UDMH 1600, 35, 2300, and 12, 500 milligram per liter, respectively. It was concluded that spills of these three fuels could be expected to seriously disrupt the natural bacterial balance in the aquatic environment. In addition, use of biological waste treatment for detoxification of these three fuels is not

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DYIC REPORT BIBLIOGRAPHY  
SEARCH CONTROL NO 055026

AD-A099 499

DESCRIPTORS (U) \*Toxicity, \*Hydrazine, \*Fuels, \*Methyl hydrazine, \*Dimethyl hydrazine(1-1), \*Hydrogen, \*Rocket fuels, \*Bacterium, \*Biodegradation, \*Fuel system, \*Rocket fuels, \*Response(Biology), \*Degradation, \*Acclimation, \*Biosure, \*Anaerobic bacteria, \*Physical properties, \*Tables(Data), \*Gelification, \*Correlation, \*Correlation(Biology), \*Inhibition, \*Rates, \*Gases, \*Chemical analysis, \*Recovery

IDENTIFIERS (U) Nitrodeacter Nitrosomonas, Denitrifying bacteria. ADUESL2103/N83. PEE3723F

SEARCH CONTROL NO 055026  
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R&D CORP SANTA MONICA CA

(U) An Analysis of Combat Aircraft Avionics Production Costs

DESCRIPTIVE NOTE Interim rept.

KAR 81 155P

PERSONAL AUTHORS Dryden, J., Britt, T., Billings

Duff, Carter, S.

REPORT NO RAND/N-1885-AF

CONTRACT NO F48620-77-C-0023

UNCLASSIFIED REPORT

**EXTRACT (U)** This report describes research directed toward developing parametric estimating relationships for the production costs of avionics suites and systems. The research sample comprised 17 combat aircraft and their avionics equipment. Potential explanatory variables were selected based on interviews with manufacturers about factors affecting avionics costs and the appropriateness of the variables for use in planning studies early in system acquisition. Multivariate regression analysis techniques were used to determine the statistical properties of candidate estimating relationships for whole suites and individual systems. The estimating equations derived for suites were generally satisfactory but not always as statistically efficient as desirable. Attempts to derive estimating relationships for avionics systems were much less satisfactory but offered improvements over the simple cost per pound metrics often used. The authors conclude that objective means for expressing technology change and its importance for avionics cost estimation remain a concern for future research.

**DESCRIPTIONS (U)** \*Parametric analysis, \*Avionics, \*Cost analysis, \*Management planning and control, \*Planning programming budgeting, \*Cost estimates, \*Multivariate analysis, \*Regression analysis, \*Acquisition, \*Attack aircraft, \*Parameters, \*Correlation techniques

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AD-A009 304	18/4	14/2	13/12	SEARCH CONTROL NO	045028
AIR FORCE ENGINEERING AND SERVICES CENTER			TYNDALL AFB FL	AD-A098 798	13/2
ENGINEERING AND SERVICES LAB			AIR FORCE ENGINEERING AND SERVICES CENTER	1/5	20/11
(U) Accidental Impact Descriptor Application Methodology			TYNDALL AFB FL	ENGINEERING AND SERVICES LAB	
DECLASSIFYING NOTE			(U) Dynamic Response of Airfield Pavement to Large		
Final rept 31 Mar 1 Aug 80.			Magnitude Loads		
PERSONAL AUTHORS	Thompson, James D	Myrick, Donald R	DESCRIPTIVE NOTE	Final rept 1	Jun 78-Jan 80
REPORT NO	AFES/C/ESL-TR-80-41		PERSONAL AUTHORS	Woolf, Donald A	
PROJECT NO	2103		REPORT NO	AFES/C/ESL-TR-80-1C	
TASK NO	BP		PROJECT NO	2104	
TASK NO	BP		REPORT NO	28	

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**ABSTRACT** (U) This report provides the intended user of accidental impact descriptors for Air Force air-to-ground weapon range planning activities a brief summary of their development, the step by step procedure for properly applying them, and an example of how the descriptors are provided in Appendix A. These descriptors, now contained in contours or significant percentages of impacts resulting in a weapon delivery training and weapon test conducted in the last 12 years, the application methodology is adapted from a previous report and includes qualifications for use of composite descriptions, identification of high potential areas and resolution of tandem conflicts. If the graphical solutions presented in this report do not resolve a tandem conflict, further analysis is

RECOMMENDED (Author)	<p><b>DESCRIPTORS (U)</b> Impact, point, range safety, spatial distribution, Coding, Weapon delivery, Air to surface, Accidents, Air Force facilities, Contamination (General), Hazards, Land use, Training ammunition, Free fall weapons, Flight paths, Bombing, Flying, Air force tests (Ordnance), Errors, Miss distance, Air force</p>
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IDENTIFIERS (U) RACHRange Compatibility Use Zones  
Strat 105 Impact: Sonci (0703 PE83722F WURSL21038P00

**ABSTRACT** (U) The evaluation of impact response of pavements requires determining the dynamic response of pavements due to large dynamic loads. This report recommends using one of the sophisticated computer codes currently available for a conventional "static" analysis of airfield pavements, but with the use of appropriate dynamic material properties to predict the dynamic response of pavement. In order to select the appropriate dynamic material properties, the stress variation as a function of time is developed for pavements subjected to moving wheel loads. A review of the literature indicates that the elastic properties and fatigue strength of portland cement concrete are relatively the same for dynamic as for static loading. The dynamic response of asphalt concrete, granular base and subbase material, and subgrade soil, however, is significantly dependent relative to the response of these materials to static loads. Further, the dynamic behavior of granular material is time-independent, but for asphalt concrete and subgrade soils, especially cohesive soils, the dynamic properties vary with aircraft velocity (i.e.,  $\tau_0$  and duration of loading). Recommendations for further research in this area are also given. (Author)

**DESCRIPTORS** (U) Pavements, "Dynamic" response, Runways, Bond damage, Repair, Concrete, Asphalt, load/forces, Stressors, Field tests.

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IDENTIFIERS  
PE03708F  
CONTINUED  
(U) *Granular materials*. NUAFESC21042327.

DTIC REPORT: BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-1298 298 11/2 7/4

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT 061

(U) *Nitric Oxide Measurement Study Volume I Options*  
Calibration.

OCT 79 221P

PRIMARY AUTHORS Dogru, I. G.; Ocikot, M. B.;  
Zabdiaski, M. F.; Durak, J.; Serry, D. J.

REPORT NO UTRC/R79 994150-1, FEA-EE-8025

CONTRACT NO DOT-FAT7NA-4081

MONITOR AFES/ESL/NASA  
TR-80-12, CR 150881

UNCLASSIFIED REPORT

ABSTRACT (U) Utilization devices suitable for providing known amounts of nitric oxide (NO) at temperatures ranging from 300 K to 2000 K and pressures of 0.5 atm (50 kPa) to 2 atm (203kPa) are described with their design considerations. Methods for controlling nitric oxide concentration are given. The spectroscopic theory for the absorption of ultraviolet radiation in the gamma (0.0) bands of nitric oxide is reviewed. Experimental values for oscillator strengths and broadening parameters for NO with various collision partners are provided. Experimental results confirming the adequacy of a computer spectral model and, hence, the calibration are presented along with the details of the model. Finally, the results of an empirical calibration of an infrared gas correlation spectrometer are given. (Author)

DESCRIPTORS (U) Combustion products, Nitrogen oxides, *Ultraviolet analysis*, Measuring instruments, Calibration, Measurement, Probe, Concentration, Composition, environment, Absorption spectra, Ultraviolet spectroscopy, Infrared spectroscopy, Temperature gradients, Reaction kinetics, Oscillators, Collision, combustion, flames, Purges, Gas flow, Heaters, Mathematical models, Error analysis.

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SEARCH CONTROL NO 059020

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UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT 061

REPORT NO

AD A097 807

(U) Nitric Oxide Measurement Study Volume III. Comparison

CONTRACT NO

OF Optical and Probe Methods

AD-A097 807

REPORT NO

UFR/C/RD-924150-3. FAA/EE 80-30

AD-A097 807

INSTITUTE

AFES/EST, NASA

TR 80-14, CR 158803

AD-A097 807

REPORT NO

98P

PERSONAL AUTHORS Zalewski, M. F., Dodge, L. G., Chikat, M.

REPORT NO

UFR/C/RD-924150-3. FAA/EE 80-30

AD-A097 807

INSTITUTE

DOT-FAT/NA-4081

AD-A097 807

REPORT NO

AFES/EST, NASA

AD-A097 807

REPORT NO

TR 80-14, CR 158803

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE. Also available as Rept. nos. NAP-PE-39C and EPK 4Rb/3-80-018. See also Volume 2. AD-A097 845

ABSTRACT. (U) Nitric oxide (NO) was measured in the exhaust of three different combustion systems by in situ ultraviolet absorption and by chemical/irradiant analysis after gas sampling with several probe designs. The three combustion systems were: (1) a flat flame burner fueled with CH<sub>4</sub>/H<sub>2</sub>/O<sub>2</sub>; (2) a research swirl burner fueled with C<sub>3</sub>H<sub>8</sub>/air; and, (3) a modified IT12 combustor operated on jet air. Each combustion system was run at several different conditions so that probe and optical measurements could be obtained over a wide range of ambient environments encompassing products from lean, stoichiometric, and rich flame conditions to combustion flame, and temperatures at centerline from 1000 to 1800 K. The results obtained with the molten-flame, water-cooled probes of different designs (all expansion type) agreed with the optical results to within 25%. Some small losses of NO (10-15%) were observed in a lean methane flame at 1800 K with an uncooled stainless steel probe, but under fuel-rich conditions up to 82% NO destruction was observed. Experimental facilities and detector head previous results are discussed and a summary of the major findings of this study is given (Author)

DESCRIPTORS. (U) "Combustion products", "Nitrogen oxides", "Infrared", "Optical analysis", "Chemical luminescence", "Envirofronts", "Research facilities", "Burners", "Combustion" AD-A097 807

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SEARCH CONTROL NO. 094018

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UNITED TECHNOLOGIES RESEARCH CENTER East HARTFORD, CONN  
 (U) Nitric Oxide Measurement Study Volume II Probe  
 No. 1061

MAY 80 113P

PERSONAL AUTHORS: Colikait, W. B., Ilini, I., Iribarne, R. G.,  
 Chippett, L. J., Dodge, L. G., Guiney, R. H.

REPORT NO. UTRC/RBD-0941050-2, FAR/VE-80-29

CONTRACT NO. DOT-FAT71N-1061

MONITOR: AFES/EEI, NASA

TR-80-13, CA-180842

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Also available as Rept. nos. NAPC-PF-38C and EPAC-04073-60-014. See also Volume 3, AD-A097 807

ABSTRACT: (U) Experimental facilities used in studying the performance of probe and sampling systems for measuring NO and describing a critical review of the literature on probe measurements of NO sub x is given with emphasis on reported results indicating that probes may perturb the total concentration of NO sub x in a flame. Also, sample line and chemiluminescent analyzer phenomena are reviewed. A model of probe aerodynamics including heat transfer is presented. Kinetics of NO loss are examined and sampling criteria for measuring nitric oxide in flames are given. Sampling probes are described that were designed to measure NO and are available for measurements on small and large combustors. Probes were also designed to do the gas flow convectively and aerodynamically. Performance of these probes is compared with model predictions. Concentrations of nitric oxide were measured using several probes for such of three flame environments. The values measured with each probe were compared and related to "true" levels of NO sub x. In addition, concentration profiles required to compare probe measurements with optical measurements are provided (author).

DISCRIPTIONS: (U) "Combustion products, 'Nitrogen oxides measurement, Quotidien minuscule, 'Chemiluminescence, probe, Combustion, Research facilities,"

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 AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
 ENGINEERING AND SERVICES LAB  
 (U) The United States Air Force Academy Solar Energy  
 Research  
 DESCRIPTIVE NOTE Final Interim rept May 78-Jan 80.

REF ID: A61 50      172P      ALG 90      71P  
 PERSONAL AUTHORS      Kean, Anthony , Benson, Joel D , Cornett, J .  
 Kenneth A ; Rigaas, Gary E ,  
 REPORT NO      AFES/ESL-FR-80-34  
 PROJECT NO      2054  
 TASK NO      80

## UNCLASSIFIED REPORT

REF ID: A61 50      172P      PERSONAL AUTHORS      Knox, Kenneth J .  
 REPORT NO      AFES/ESL-TR-80-43  
 PROJECT NO      2054  
 TASK NO      80  
 UNCLASSIFIED REPORT

ABSTRACT (U) Evaluation of Vibratory Rollers for Bond Damage Repair  
 DESCRIPTIVE NOTE Final rept Oct 78-Sep 79.

## UNCLASSIFIED REPORT

ABSTRACT (U) Four vibratory rollers in the 8.5 to 17 ton range were evaluated for use in bond damage repair of airfields. The rollers were tested for both compaction ability on grade and on crushed limestone. After this initial testing, the two most promising rollers were tested by operating simulated bomb craters using 2-inch thick layers of crushed limestone compacted only from the surface. These rollers were tested with F-4 load-craft traffic. Despite difficulties in predicting roller performance, 10-ton vibratory rollers or heavier are capable of compacting crushed limestone from the surface only to support F-4 loads (Author)

ABSTRACT (U) This research continued to gather operational performance data and maintenance experience on a retrofit residential solar space heating system. Data analysis includes comparison to prior years' results. Separate chapters are devoted to analyzing the performance of evacuated tube collectors and the home's response to solar dependency on solar energy during a selected winter period. Considerable attention is given to actions that were taken to prepare the system for a return to normal occupancy (the home was vacant until October 1978). Information concerning the purchased need for development of an operations and maintenance manual and a "homemaster" manual is included. Complete copies of the development manuals are appended to this report (Author)

DESCRIPTORS (U) \*Solar heating , \*Solar energy ,  
 \*Household building , \*Retrofitting , \*Maintenance , Solar collectors ,  
 Tables , Systems engineering , Manuals ,

IDENTIFIERS (U) PEB4708F      WUAFES270545005

IDENTIFIERS (U) Crushed stone , \*Vibratory rollers ,  
 PEB4708F , WUESI 20546B01

## UNCLASSIFIED

AD-A085 928 13/2 1/8 DTIC REPORT BIBLIOGRAPHY

AIR FORCE PLANNING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

(U) Small Crater Expedient Repair Test

DESCRITIVE NOTE. Final Rep't Jul-Aug 79.

AD 80 11GP

PERSONAL AUTHORS Knox, Kenneth J.

REPORT NO AFES/ESL-TR 80-42

PROJECT NO 2104, 2054

TASK NO 28

## UNCLASSIFIED REPORT

ABSTRACT (U) This report describes actual field repairs of six size 1 craters, four using unsurfaced crushed limestone compacted only from the surface with 10-ton vibratory rollers, and two repaired with hand-mixed polymer-concrete. Following the repairs the runway was trafficked with an F-4 loadcart. The crushed limestone method proved suitable for the repair of small craters, the hand-mixed polymer-concrete method was not suitable for repairs larger than approximately five feet in diameter (Author)

DESCRIPTORS (U) \*Repair. Runways. Bomb damage. Craters. Filling. gravel. Limestone. Concrete. polymers.

IDENTIFIERS (U) \*Bomb damage repair. Crushed stone. Polymer concrete. PED3723T. MUAFESC2 1042822

IAC NO PL-03R4B

IAC DOCUMENT TYPE PLASTIC - MICROFICHE -

TAC SUBJECT TERMS P - (U) Repair. Polycrystalline concrete. Soil surfacing. Aggregate. Patching. Airfields. paving. Silica. Quality assurance. Limestone. Cements. Blends. Z2 Unlabeled.

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AD-A085 891 1/8 13/2  
SEARCH CONTROL NO 055028  
AD A085 891 1/8 13/2  
AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB  
(U) \*Rush AM-2 Mat Patch for Rapid Runway Repair  
DESCRITIVE NOTE Final rep't May 78-Nov 79.  
SEP 80 9AP  
PERSONAL AUTHORS Greene, James L.  
REPORT NO AFES/ESL-TR 80-45  
PROJECT NO 2104, 2054  
TASK NO 28, 88

## UNCLASSIFIED REPORT

ABSTRACT (U) This report describes a research and development program to investigate the feasibility of using AM-2 landing mats on a rush surface over bonds craters in runways. The AM-2 landing mat concept under test was designed to allow flexibility to adjust to varying crater sizes. Four systems of anchoring AM-2 mats patches to the surrounding pavements were tested. Each system, when installed over filled craters, was tested with an F-4 land cart (Author)

DESCRIPTORS (U) Landing mats. Runways. Concrete bond damage. Craters. Filling. Coverings. Pavails. Rafts. Field tests. Loads(Forces). Deformation

IDENTIFIERS (U) \*AM-2 Landing mats. MUAFESC2 1042822  
MUAFESC2 1042823. PED4708F. PED3723T

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PAGE 307  
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## UNCLASSIFIED

AD-A095 057 21/4 21/5 1/3

GENERAL ELECTRIC CO GINCINGRATY ON AIRCRAFT ENGINE GROUP

(U) Evaluation of Fuel Character Effects on J79 Shockless Combustor

DESCRIPTIVE NOTE Final technical rept 1 Jul 79 1 Jun 80

NOV 80 194P

PERSONAL AUTHORS Gisseson, C. C. Ollier, T. L. Shayson, M. W. Kefaroff, N. J.

REPORT NO AFDAE0018

CONTRACT NO F33615-79-C 2033

PROJECT NO 3048

TASK NO 04

MONITOR AFMRL AFES/ESL

TR-00-2052, R-80-48

## UNCLASSIFIED REPORT

**ABSTRACT** (U) Results of a program to determine the effects of broad variations in fuel properties on the performance, emissions, and durability of the J79-17C turboprop engine combustion system are presented. Thirteen different fuels were tested, covering a range of hydrogen contents, aromatic types, boiling ranges, and viscosities. At high power operating conditions, fuel hydrogen content was found to be a very significant fuel property with respect to linear temperature, flame radiation, smoke, and NO<sub>x</sub> emission levels. At idle and cruise operating conditions, CO and HC emission levels were found to be dependent on both fuel hydrogen content and relative spray droplet size. At cold day ground start conditions, light oil correlated with the relative fuel droplet size. At takeoff weight, limits at low flight Mach numbers were fuel dependent and also correlated with the relative fuel droplet size. Combustor life analysis, based on the test data, yielded relative life predictions of 1.00, 0.93, 0.93, and 0.73 for fuel hydrogen contents of 14.5, 14.0, 13.0, and 12.0 percent, respectively. High temperature cyclic fuel nozzle fouling tests revealed significant effects of fuel quality and operating temperature on nozzle life. The results correlated with laboratory

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DTRC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 015076

AD-A095 057

CINCPAC

DESCRIPTORS (U) Jet engines fuels, Turboprop engines, Combustors, Performance (engineering), Emission, Combustion, Chemical composition, Boiling, Viscosity, Quality, Nozzles, Life expectancy

IDENTIFIERS (U) J-79-17C eng1194, AFMRL AFES/ESL, PEG2203F

J-79-17C eng1194, AFMRL AFES/ESL, PEG2203F

J-79-17C eng1194, AFMRL AFES/ESL, PEG2203F

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## DODIC REPORT BIBLIOGRAPHY

AD-A084 802 13/1 15/5 AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL

ENGINEERING AND SERVICES LAB

(U) The U. S. Air Force Academy Solar Energy Research Project Summary Report

Descriptive Note: Rept for Apr 78-Jan 80.

JUL 80 103P

PERSONAL AUTHORS: Cornelius, Kenneth A.

REPORT NO: AFESC/ESL-TR-80-35

PROJECT NO: 2054

TASK NO: 50

## UNCLASSIFIED REPORT

544  
**ABSTRACT:** (U) This report summarizes the solar energy research which was conducted by the U.S. Air Force Academy from April 1975 to January 1980. This research consisted of investigations on a retrofit space heating system which was installed on a typical Military Family Housing (MFH) unit. This summary uses a lessons learned and design (gray) approach in its discussion of the solar system's operation. This discussion is organized around the many areas of solar technology which were investigated during the retrofit project. Those areas were energy conservation effects, solar collector, thermal storage, control systems, Thermography studies, performance comparison to a design model, and homeowner and maintenance manual development. A thermal performance summary of the solar system is also presented. The report concludes with numerous recommendations regarding policy initiative which the Air Force should take to foster conversion to solar technology. (Author)

**DESCRIPTIONS:** (U) •Solar heating, •Military facilities, •Household buildings, •Solar collectors, •Solar energy, •Energy consumption, •Energy conservation, •Cost analysis, •Installation, •Space heaters, •Maintenance, •Operation, •Storage tanks, •Thermography, •Test and evaluation, •Performance (Engineering)

IDENTIFIERS: (U) AFESC/20545005, PEA4708F

AD-A084 802

## UNCLASSIFIED

SEARCH CONTROL NO: 055028  
AD A084 187 3/3/2 8/20 6/18  
AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB(U) The Toxicity and Biodegradability of Hydrazine  
Wastewaters Treated with UV-Chlorination

Descriptive Note: Final rept Dec 78-Feb 79.

APR 80 GCP

PERSONAL AUTHORS: Nachinski, Anthony M; Farmwald, Jay A.

REPORT NO: AFESC/ESL-TR-80-31

PROJECT NO: 1800

TASK NO: 70

## UNCLASSIFIED REPORT

**ABSTRACT:** (U) Warburg respirometric techniques were used to study the toxicity and biodegradability of a hydrazine wastewater treated with both the gas and ultraviolet radiation. The contrived wastewater, containing 900 ppm each of neat hydrazine, monomethyl hydrazine, unsymmetrical dimethyl hydrazine, and dimethyl nitrosamine, was representative of those to be generated at the Rocky Mountain Arsenal Blend Facility. (Author)

**DESCRIPTIONS:** (U) •Hazard Water, •Toxicity, •Biodegradation, •Effluents, •Hydrazine, •Waste treatment, •Ultraviolet radiation, •Bacteria, •Cultures (biology), •Sludge, •Milk, •Oxygen consumption, •Activated carbon, •Ion exchange

IDENTIFIERS: (U) Respirometers, AFESC/19007003, PEG201F

PEG201F

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

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AD-A094 017

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HARCO CORP MEDINA OH

(U) Pipe-to-Soil Potential Limits for Protective Coatings

DESCRIPTIVE NOTE Final rept Nov 77-Apr 80.

NOV 80

38P

PERSONAL AUTHORS Harcock, Bernard.

CONTRACT NO F08935-77-C-0248

PROJECT NO 2104

TASK NO SC

MONITOR AFSC/CEST

TR 80-26

UNCLASSIFIED REPORT

545

ABSTRACT (U) This report summarizes the results of a study undertaken to determine the limiting potential criteria for cathodic protection of coated metallic underground and underwater facilities to avoid damage from hydrogen evolution. Tests of 30 days duration were performed in Houston tap water on four coatings, i.e. fusion bonded epoxy, coal tar, plastic tape and asphalt. Each coating was cathodically protected at a polarized instant of potential levels of -0.1, -1, -17, and -22 volts to copper-copper sulfate. It was found that hydrogen evolution is initiated at a polarized potential of -1.12, volts and becomes more vigorous as the applied current is increased. The polarized potential value increases as the current increases only up to a value of -1.22 volts. An increase in applied current beyond that value increases the hydrogen evolution and increases the OH potential but there is no measurable increase in the OH potential. The different coatings tested reacted differently in these tests. These short term tests should not be used for comparison of disbondment resistance. One coating experienced disbondment at an off potential where no gas was evident, and another coating experienced no disbondment even at -22 volts under vigorous hydrogen evolution (Author)

DESCRIPTORS (U) \*Protective coatings. \*Limitations. \*Cathodic protection. Copper compounds. Plastics. Tapes.

AD-A094 017

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Hydrogen, Currents, Asphalt, Polarization, Mater, Value  
Sulfators, Standards  
IDENTIFIERS (U) Potential MUESL21045C01, PEB3723F  
IAC NO PL-038550  
IAC DOCUMENT TYPE PLASTIC - MICROFICHE --  
IAC SUBJECT TERMS P - (U) polarization, Bonding, Protective coatings, Coatings, UnderGround applications Epoxy, Pitch, Asphalt, Epoxy, Coal tar, Corrosion resistance, pipe, Galvanic corrosion, Scotchkota 212, Water immersion, HOPE, Servisrap, Electrical properties, Property degradation, Standards, Polyethylene, Unlited.

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SEARCH CONTROL NO. 085028  
SYN REPORT BIBLIOGRAPHY  
AD-A084 003 CONTINUED

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
AIR FORCE ENGINEERING AND SERVICES LAB

(U) Analysis for the Accuracy Definition of the Air Quality Assessment Model (AQAM) at Williams Air Force Base, Arizona  
Volume II Appendices

DESCRIPTIVE NOTE Final rept JUL 76-Mar 80.

MARK 80 2010  
PERSONAL AUTHORS: Yannarino, R. J., Conley, L. A., Roto, D.  
N. L. March, F. J., Dunphy, E. P.

REPORT NO. AFESC/ESL-TR-80-10-VOL-2

PROJECT NO. 1900  
TASK NO. 20

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE. See also Volume 1, AD-A081 171

ABSTRACT (U) The air quality Assessment Model (AQAM) overall predictive accuracy is analyzed using actual air base ambient air quality measurements. These measurements of  $\text{CO}$ ,  $\text{NO}_x$ ,  $\text{THC}$ ,  $\text{O}_3$ , and visibility at Williams Air Force Base, Arizona, from June 1976 to June 1977 were compared with AQAM's predicted air pollution concentrations to determine AQAM's predictive power. The AQAM is analyzed on an hour-by-hour basis and statistical conclusions are that AQAM accuracy is within the accuracy range expected for Gaussian urban dispersion models. Even though an attempt was made to select an isolated base from urban background emissions, the background concentrations had to be accounted for in the analysis. Concentrations in the air base vicinity were extremely low when compared with background concentrations resulting from urban transport. Without the background concentration adjustments, the AQAM model tended to underpredict the pollutant concentrations. The results also indicate that AQAM is especially accurate in simulating the potential worst case infrared concentrations associated with morning hours, low wind speeds, stable atmospheric conditions, and high activity (Author)

AD-4084 003

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AD-A084 003 Appendices. NUAFSC10008004, PR0201F

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SEARCH CONTROL NO 055028

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AD A093 817  
 13/7 12/1  
 LITTLE (ARTHUR D) INC CAMBRIDGE MA  
 (U) Spill Assessment Model (SAM) Procedure for Manual  
 Field Calculations  
 DESCRIPTIVE NO-F Final rept Feb 79-Feb 80  
 APR 80 101P  
 PERSONAL AUTHORS Potts, Richard A., Nugent, John H.  
 Schlossnagle, George W.  
 CONTRACT NO F08035-79-C-0084  
 PROJECT NO SAMS  
 TASK NO DP  
 MONITOR AFSC/EE/SL  
 TR-80-22

UNCLASSIFIED REPORT  
 Availability Document partially illegible  
 ABSTRACT (U) The objective of the field procedure is to provide a means of rapidly assessing the approximate extent of concentrations in water in excess of hazard levels by application of the spill assessment model (SAM). This manual provides a simple calculation procedure that can be rapidly applied in the field to obtain estimates of the potential extent of a hazardous spill from a discharge of soluble hazardous materials into navigable waters. These field procedures have been derived from complex analytical and computer based models describing the behavior of certain types of spilled chemicals in water as developed in FSL TR-80-07. The calculation procedures for field use have been developed in the form of a series of graphs and tables, and parent hazard extent estimates to be rapidly made when time or resources are not available for more complex computations. The data required for these field computations can be immediately obtained or estimated. The procedures for field use may be applied to obtain estimates of the concentration in water resulting from the spill of a soluble chemical having a density close to that of water. It is assumed that the chemical is fully soluble in water and that all the discharged chemical goes into solution with water in

547

DESCRIPTORS (U) Water pollution, Water analysis, Chemicals, streams, Mathematical models, Spilling, Spills, Hydrostatic, Concentration(Composition), Toxic hazards, Field conditions, Rivers, Channels (Waterways), Downstream flow conditions, Dispersions, Measurements, Width, Depth, Range(Distance), Velocity, Graphs, Computations, Tables(Data), Manuals, Field tests

IDENTIFIERS (U) PF750717 MIAFESCAHSIDP02

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AD A093 817  
 13/7 12/1  
 LITTLE (ARTHUR D) INC CAMBRIDGE MA  
 (U) Spill Assessment Model (SAM) Procedure for Manual  
 Field Calculations  
 DESCRIPTIVE NO-F Final rept Feb 79-Feb 80  
 APR 80 101P  
 PERSONAL AUTHORS Potts, Richard A., Nugent, John H.  
 Schlossnagle, George W.  
 CONTRACT NO F08035-79-C-0084  
 PROJECT NO SAMS  
 TASK NO DP  
 MONITOR AFSC/EE/SL  
 TR-80-22

UNCLASSIFIED REPORT  
 Availability Document partially illegible  
 ABSTRACT (U) The objective of the field procedure is to provide a means of rapidly assessing the approximate extent of concentrations in water in excess of hazard levels by application of the spill assessment model (SAM). This manual provides a simple calculation procedure that can be rapidly applied in the field to obtain estimates of the potential extent of a hazardous spill from a discharge of soluble hazardous materials into navigable waters. These field procedures have been derived from complex analytical and computer based models describing the behavior of certain types of spilled chemicals in water as developed in FSL TR-80-07. The calculation procedures for field use have been developed in the form of a series of graphs and tables, and parent hazard extent estimates to be rapidly made when time or resources are not available for more complex computations. The data required for these field computations can be immediately obtained or estimated. The procedures for field use may be applied to obtain estimates of the concentration in water resulting from the spill of a soluble chemical having a density close to that of water. It is assumed that the chemical is fully soluble in water and that all the discharged chemical goes into solution with water in

AD-A093 817

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AD-A093 480	21/9 1	7/3	0/18
CALIFORNIA UNIV RESEARCH CENTER			
(U) Atmospheric Chemistry of Hydrazines Gas Phase Kinetics and Mechanistic Studies			
DESCRIPTIVE NOTE. Final rept Sep 78-Jun 80.			
AUG 80	SOP		
PERSONAL AUTHORS	Pitts, James M., Jr	Turazon, Ernesto C.	
Carter, William P.	L. Wilner, Arthur N.	Harris, Geoffrey N.	
CONTRACT NO	F08635-78 C-0307		
PROJECT NO	1800		
TASK NO	20		
MONITOR	AFESC/ESL		
	TR-80-39		

UNCLASSIFIED REPORT

ABSTRACT. (U) Relatively little work has been done on the atmospheric chemistry of nitrogen-containing compounds such as amines and hydrazines, which are widely used in industrial and military applications. However the discovery of compounds such as N-nitrosamines in the environment and concern regarding their impact on man indicate the need to further elucidate the role of nitrogenous compounds in the atmosphere. The Air Force is presently assessing the environmental impact of the Space Transportation System which uses hydrazines as one of the fuels. In addition, hydrazine is used as a propellant in the F-16 for emergency power. Both uses will result in potential atmospheric releases which should be controlled to a degree dictated by the impact of hydrazines on ambient air quality. Thus, the present study was designed to experimentally evaluate the atmospheric fate of unsubstituted hydrazine (NHNH<sub>2</sub>), monoethylhydrazine (NHEH), and unsymmetrical dimethylhydrazine (UDMH).

DESCRIPTORS (U)

\*Hydrazine. \*Atmospheric chemistry.  
\*Reactions. \*Kinetics. \*Gases. Air quality. Phase. Analysis.  
Military applications. Release. Humans. Methyl hydrazines.  
Environmental impact statements. Nitrogen compounds

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 AD-A092 165      13/2      1/5      20/11  
 NORTHROP SERVICES INC      LAS VEGAS NV      1/3  
 AIR FORCE ENGINEERING AND SERVICES CENTER      TYNDALL AFB FL  
 AIR SERVICES CENTER      AIR SERVICES CENTER  
 ENGINEERING AND SERVICES LAN

(U) WILLIAMS Air Force Base Air Quality Monitoring Study.

JUL 80      91P

PERSONAL AUTHORS      Stassley, D C ,Gordon, S J ,Ehrtart, M L

CONTACT NO      FPA-08-02-2581

MONITOR      FPA/600/4, ATESC/611  
 40-037, TR-79-31

UNCLASSIFIED REPORT

DTIC REPORT BIBLIOGRAPHY      SEARCH CONTROL NO 055028  
 AD-A092 057      1/3  
 AIR FORCE ENGINEERING AND SERVICES CENTER      TYNDALL AFB FL  
 AIR SERVICES CENTER      AIR SERVICES CENTER  
 ENGINEERING AND SERVICES LAN

(U) Modal Analysis for Aircraft Response to Runway Surface Roughness

JUN 80      4IP

DESCRIPTIVE NOTE      Final rept 1 Jun 78-30 Jun 80.

PERSONAL AUTHORS      Gajewski, Ralph R .

REPORT NO      AFESC/ESL-TR 80-32

PROJECT NO      2104

TASK NO      2B

ABSTRACT (U) Air quality and meteorological data were collected continuously from a network of five ground monitoring stations located at Williams Air Force Base (WAFB) near Phoenix, Arizona, during June 1978 through June 1977. Data reported here will serve as detailed input for developing the accuracy limits of the Air Quality Assessment Model (the data have been analyzed in order to determine the air quality impact attributable to WAFB operations). Also reported are the preliminary results obtained from several related special studies designed to obtain horizontal and vertical dispersion of WAFB emissions. The data indicate no significant air quality impact at WAFB resulting from aircraft operations (Author)

DESCRIPTORS (U) \*Air quality. \*Air pollution. \*Air Force facilities. \*Airports. \*Aircraft exhaust. \*Monitoring. \*Spectrometers. \*Gas chromatography. \*Chemiluminescence. \*Naphthalene. \*Laser velocimeters. \*Pyranometers. \*Hydrocarbons. \*Nitrogen oxides. \*Methane. \*Carbon monoxide. \*Mathematical models. \*Measurement. \*Meteorological data. \*Mathematical models. \*Measurement. \*Data processing. \*Pollutants. \*Emission. \*Dispersions

IDENTIFIERS (U) Environmental impact. Gaussian plume model

## UNCLASSIFIED REPORT

ABSTRACT (U) This report develops one and three degree-of-freedom linear vibration models for the prediction of aircraft response to runway surface roughness. The equations of motion are integrated in principal coordinates using modal analysis. The modal parameters required are natural frequency, damping ratio, and modal shape for each degree of freedom. Comparison of results is made with the TAXI code that has a nonlinear strut model. Results are presented for asymmetric motion due to spell profiles in the runway (Author)

DESCRIPTORS (U) \*Surface roughness. \*Dynamic response. \*Runways. \*Aircraft. \*Vibration. \*Frequency. \*Damping. \*Mathematical models

IDENTIFIERS (U) Modal analysis. PES3723F      WUESL2101-B-30

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AD-A092 057

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AD-A091 803	13/2	8/2	055026
LITTLE (ARTHUR D) INC	CAMBRIDGE MA		AD-A091 803 CONTINUED
(U) SPILL ASSESSMENT Model User's Manual			MUAFESCSANSDP02
DESCRIPTION NOTE	Final rept	Feb 79-Feb 80.	
MAY 80	194P		
PERSONAL AUTHORS	Potts, Richard G	Hagopian, John H	
CONTRACT NO	FOR335-79-C-0084		
PROJECT NO	SAMS		
TASK NO	DP		
MONITOR.	AFESC/ESI		
	TR 80-27		

## UNCLASSIFIED REPORT

**ABSTRACT** (U) This report is a user's guide to the SPILL ASSESSMENT Model (SAM) which is a mathematical model for application in assessing the impact of catastrophic spills in waterways as developed in TSI-TR-80-07. The spill model addresses instantaneous and continuous point source discharges into water courses including rivers, lakes, straits, and estuaries. The model is in a generalized form using parameters and interchangeable data items so as not to unnecessarily restrict the scope of application to hydraulic. SAM estimates the extent and duration of hazardous concentrations in water-bodies associated with accidental discharges and determines when these concentrations drop below toxic levels. SAM is considered as a management tool to support clean-up operations in the event of a spill, to permit post-incident analyses, and to serve as a basis for contingency planning. (Author)

**DESCRIPTIONS** (U) Water pollution, oil spills, computerized simulation, computer program documentation, hydrostatic, hazardous materials, estuaries, lakes, rivers, chemical properties, dispersions, rocket propellants, FORTRAN, input output processing, user needs, handbook, specifications

**IDENTIFIERS** (U) SAM(SPILL) Assessment Model, SAM Computer program, CDC 8600 computers, PEG7001F, AD-A091 803

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AD-A091 717 4/2 0/8  
TENNESSEE UNIV KNOXVILLE DEPT OF CIVIL ENGINEERING  
(U) Air Force Runoff Model (AFRM) User Manual  
Documentation  
Descriptive Notes Final rept Oct 78-uni 80.  
JUL 90 61P  
PERSONAL AUTHORS Riverton Donald E., Schlossmeyer, George  
W., Stibert, Michael G.  
CONTRACT NO F08035-77-C-0254  
PROJECT NO 1900  
TASK NO S0  
ADVISOR AFESC/ESL  
TR-80-29

## UNCLASSIFIED REPORT

## SEARCH CONTROL NO 055028

AD-A091 717 12/1 12/2

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

(U) Analysis for the Accuracy Definition of the Air  
Quality Assessment Model (AQAM) at Williams Air Force  
Base, Arizona Volume I Technical Discussion

## DESCRIPTIVE NOTE Final rept Jul 79-Mar 80.

MAR 80

140P

PERSONAL AUTHORS Yamartino, R. J., Conley, L. A., Rose, D.  
K., Lanch, F. J., Murphy, E. P.

REPORT NO AFESC/ESL-TR-80-19-Vol-1

PROJECT NO 1900

TASK NO 90

## UNCLASSIFIED REPORT

ABSTRACT (U) The Air Force Runoff Model (AFRM) is a stormwater runoff simulation model designed to predict stormwater flow and quality resulting from real or design storms for small watersheds generally limited to 2,000 acres or less. The principal model inputs are watershed area, land use characteristics, percent forested, percent impervious, and percent denuded. The input will also include a observed hydrograph or an estimated Soil Conservation Service Curve Number (CN). The model is based upon 40 storms in 10 watersheds. Output is both tabular and graphical and provides the watershed hydrograph, pollutograph, and discussion of model assumptions. This report provides a background of the model, batch user instructions for CDC 6600 computers, and two example problems. The complete software package is provided in the Appendix (Author)

DESCRIPTORS (U) Runoff, Rainfall, Watersheds, Water pollution, Mathematical models, Computerized simulation, Programming manuals  
REFERENCE (U) \*AFRM computer program  
NUAF 10005, PEO2801F

AD-A091 717

## UNCLASSIFIED

ABSTRACT (U) The Air Quality Assessment Model (AQAM) overall predictive accuracy is analyzed using actual air base ambient air quality measurements. These measurements of CO, NO, NO<sub>x</sub>, THC, CH<sub>4</sub>, and visibility at Williams Air Force Base, Air Zone, from June 1977 to June 1978 are compared with AQAM predicted air pollution concentrations to determine AQAM's predictive power. The AQAM accuracy is analyzed on an hour by-hour basis and statistical conclusions are that AQAM accuracy is well within the accuracy range expected for Gaussian urban dispersion models. Even though an attempt was made to select an isolated area from urban background emissions, the background concentration had to be accounted for in the analysis. Concentrations in the air base vicinity were extremely low when compared with background concentrations resulting from urban transport. Without background concentration adjustments, the AQAM model tended to underpredict the pollutant concentrations. The results also indicate that AQAM is especially accurate in simulating the potential worst case airbase concentrations associated with morning hours, low wind speeds, stable atmospheric conditions and high activity (Author)

DESCRIPTORS (U) Mathematical models, Air quality.

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## UNCLASSIFIED

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Air pollution, Air force facilities, Airports, Military aircraft, Plumes, Carbon monoxide, Nitrous oxide, Methane, hydrocarbons, Pollutants, Measurement, Meteorological data, Concentration/Composition, Wind velocity, Dispersion, Frequency, Distribution, Accuracy, Time Intervals, Statistical analysis

IDENTIFIERS (U) AOGMAIR Quality Assessment Model 1, ENVIRONMENTAL IMPACT ASSESSMENT, AFMFS/19005004.

PERIODICITY

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SEARCH CONTROL NO 095026

AD-A690 942 13/2 12/1 21/0 1

LITTLE (ARTHUR D) INC CAMBRIDGE MA.

(U) Mathematical Development of the Spill Assessment Model (SAM) for Hydrazine and Similar Acting Materials in Water Bodies

DESCRIPTIVE NOTE Final rept Feb 79-Feb 80.

FEB 80 388P

PERSONAL: PUTNAM, Foltz, Richard G., Hargrave, John H., Hoodruff, Caron H., Raj, Phani P.;

CONTRACT NO FOR935-78-C-0064

PROJECT NO SAMG

TASK NO DIP

MONITOR AFSC/ESL

TR-80-07

## UNCLASSIFIED REPORT

ABSTRACT (U) The objective of this work was to develop a mathematical model for spill simulation in assessing the impact of catastrophic spills. Specifically, the model evaluates instantaneous and continuous point source discharges into water courses including rivers, lakes, and estuaries. The spill model primarily assesses dispersive characteristics of spills, the hydrocarbon family fuels in the aquatic environment, however, the development of the model has been carried out in a generalized form using parameters and interchangeable data items so as not to restrict the scope of application unnecessarily. Results which can be produced by the model include the pollutant concentration as a function of location, time, and physical, chemical, and biological characteristics of the pollutant. The spill model estimates the extent and duration of hazardous concentrations in water bodies associated with accidental discharges and determines when these concentrations drop below to safe levels. The spill model is designed to become a management tool to support a clean-up operation in the event of a spill, to provide emergency discharge contingencies planning, to permit post incident analyses, and to serve as a basis for further development of methods of hazard assessment. (Author)

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AD-A090 947 CONFIDENTIAL

SEARCH CONTROL NO 055028

AD-A090 203 21/4 13/2  
AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FLENGINEERING AND SERVICES LAB  
(U) The Implications of Alternative Aviation Fuels on  
Water pollution statement. Streams, Lakes, Rivers, Estuaries,  
Planning and Control. Hazards, Humans, Aquatic organisms  
Toxicity, Concentration(Composition), Chemical analysis,  
Distribution, Refinement, Time Intervals, Mathematical  
analysisIDENTIFIERS (U) Environmental impact assessment.  
MFATSCASWSP02. PE780017DESCRIPTORS (U) Water pollution, Mathematical models  
Hydrocarbons, Spilling, Liquid rocket fuels, Hazardous  
water pollutants, Streams, Lakes, Rivers, Estuaries,  
Water pollution statement, Hazards, Humans, Aquatic organisms  
Toxicity, Concentration(Composition), Chemical analysis,  
Distribution, Refinement, Time Intervals, Mathematical  
analysis

REPORT DATE Nov 77-MUG 80.

PERSONAL AUTHOR Scott, Harold A., Jr.

REPORT NO AFESC/ESL-TR-80-38

PROJECT NO 2103

TASK NO 9A

## UNCLASSIFIED REPORT

**ABSTRACT** (U) Aircraft alternative fuel emission factors from turbine engine combustor performance tests were integrated into the Air Quality Assessment Model (AQAM) to predict the air quality impact of alternative fuels use in the vicinity of Air Force bases. AFACI computes the alternative fuel emission factors from fuel property inputs, enabling the model to predict concentrations for any proposed alternative fuel blend. In addition to aircraft alternative fuel emissions calculations, AQAM was modified to calculate alternative fuel handling and breathing loss emissions from the fuel properties using AQAM with two aircraft engine models, the aircraft alternative fuel annual emissions and resulting short-term pollutant concentrations are computed for a typical Air Force base. The analysis indicates that aircraft fuel emissions cause a slight increase in pollution concentrations when compared with the baseline fuel. A reduction of evaporative hydrocarbon emissions is predicted due to the alternative fuels' lower volatility in comparison with JP-4 (Author)

**DESCRIPTORS** (U) Aviation fuels, Air quality, Air Force facilities, Airports, Aircraft engines, Jet engine fuels, Concentration(Chemistry), Comparison, Kerosene, Combustion, Emission spectra, Mixtures, Hydrocarbons, Air pollution, Volatility, Handling, Evaporation, Evaporation Predictions, Dispersion, Computations

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AD-A090 283	CONTINUAFF	AD-A090 282	21/6
IDENTIFIERS	(L) Alternative fuel#s. WUAFES29*035A98.		13/4
	P003713F		1/3
		AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL	
		ENGINEERING AND SERVICES LAB	
		(U) USAF Aircraft Engine Emission Goals: A Critical Review	
		DESCRIPTIVE NOTE	Final rept. Sep 78-June 79.
		SEP 78	211P
		EDITORIAL AUTHOR(S)	Douglas, Richard W., Martone, Joseph A.
		REPORT NO	AFES2/ESL FR-79-30
		SUBJECT NO	1900
		TASK NO	70

## UNCLASSIFIED REPORT

**ABSTRACT** (U) This report is a comprehensive summary and analysis of proposed aircraft turbine engine air pollution regulations and their relevance to the USAF. Existing USAF aircraft turbine engine emission goals are critically reviewed, and revised goals are proposed. The original goals contained emission standards and compliance dates; the proposed goals contain neither. The authors believe that the goals should be set to provide an incentive for emission reduction and should not be numerical standards and dates, which may or may not be met. The proposed USAF goals is cover the critical turbine engine emissions: carbon monoxide and oxides of sulfur are not considered. Serious problems at today's emission levels, while juvenile and hydrocarbon emissions appear to warrant the highest priority for reduction. Although cost effectiveness is considered, the USAF has selected the most cost effective oxidizer. It is recommended that NO<sub>x</sub> sub x reduction deserves continued USAF research. (Author)

**DESCRIPTIONS** (U) Gas turbines, fuel impurities, aircraft gases, smoke, hydrocarbons, nitrogen oxides, emission planning, control, environmental protection, fuel/thermodynamic, atmospheric models, stratosphere, airports, environmental impact statements.

**IDENTIFIERS** (U) BACT/Best Available Control Technology, IDAFECI9007001, PEG2601F

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DTIC REPORT BIBLIOGRAPHY		SEARCH CONTROL NO	055028
AD-A090 261	7/3	AD-A090 261	CONTINUED
AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL		IDENTIFIERS (U)	
PROTOTYPING AND SERVICES LAB		Autoxidation, Unsymmetrical	
(U) The Vapor-Phase Autoxidation of Unsymmetrical		dimethylhydrazine Fraction vessels. PEG20013	
Dimethylhydrazine and 50-Percent Unsymmetrical		MILSPEC19002013	
Dimethylhydrazine - 50-Percent Hydrazine Mixtures			
DESCRIPTIVE NOTE Final rept Jan 79 Oct 79.			
AFR	UO	32P	
PERSONAL AUTHORS Stone, Daniel A			
REPORT NO	AFSC/EST-TR-60-21		
PROJECT NO	19000		
TASK NO	20		
UNCLASSIFIED REPORT			

ABSTRACT (U) The autoxidations of unsymmetrical ethanethyldiazine (UDME) and a mixture of 50-percent UDME and 50-percent hydrazine (50-50 blend) have been studied at pressures of several Torr in 44-cm reaction vessels and several pipes in a long path cell. With initial UDME pressures of several Torr, autoxidation proceeded too rapidly to be determined, even on natural decay timescales, then the initial UDME pressure was lowered to a few Torr, the addition of oxygen caused approximately a first order decay with a half-life of about 84 hours. The initial oxidation product under these conditions was formaldehyde dimethylhydrazine. The 50-50 blend did not behave as two independent systems. Instead, there were substantial positive synergistic effects observed. At concentrations of a few Torr of each component, the addition of oxygen resulted in a 10- to 20-fold increase in decay rate over that shown by UDME or hydrazine by itself. At 100% concentration levels the situation was similar for UDME where a four-fold oxidation rate increase was observed when compared with a similar experiment with no hydrazine present. However, hydrazine oxidation in the 50-50 blend was somewhat slower than that it was in a similar experiment with only hydrazine present (Author)

DESCRIPTORS (U) Hydrazine derivatives, vapor phases, autoxidation, mixtures, rates, hydrazine, oxygen decay, formaldhyde, reaction kinetics

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		DTIC REPORT BIBLIOGRAPHY		SEARCH CONTROL NO	035028
AD-A089 083	20/5	14/2	13/2	AD-A089 608	11/1
STANFORD UNIV	CA	EDWARD L GINZTON	LAB OF PHYSICS	BATTELLE COLUMBUS LABS OH	
(U) Remote Atmospheric Measurements of CH4 Using a Line-Of-Sight Tunable Source				(U) Polymer Research in Rapid Runway Repair Materials	
DESCRIPTIVE NOTE Final technical rept Oct 78-Mu 79.				DESCRIPTIVE NOTE Final rept Jan-Oct 79.	
MAR 80	27P	PERSONAL AUTHORS Luttinger, Hanford; Kistler, Charles W.; J.J.; Grotta, Henry A.; Sivakar, Richard G.			
PERSONAL AUTHORS Bayar, Robert L.; Endemann, Martin.					
CONTRACT NO	EPA-R-805780-01				
PROJECT NO	1800				
PROJECT NO	1800				
TASK NO	20				
IDENTIFIER	AFSC/ESL				
	(R-80-11)				

## UNCLASSIFIED REPORT

**ABSTRACT** (U) A laser transmittance tuned by means of a 2-lithium rubidium optical parametric oscillator was employed to demonstrate the capability for remote measurement of gaseous pollutants in the atmosphere. Measurements of methane were obtained continuously over an 18-hour period with a precision of better than 0.08 parts per million. The long path measurements of methane were in excellent agreement with a Bay Area Pollution Control District point monitoring capability. Some of the tunable laser transmitter to measure other molecules, as well as atmospheric temperature, are discussed. (Author)

**DESCRIPTORS** (U) \*Tunable lasers, \*Remote detectors, \*Atmospheric pollutants, \*Atmospheric absorption spectra, \*Infrared spectra, \*Temperature measuring instruments, \*Lithium compounds, \*Niobates, \*Oscillators, \*Monitors

**IDENTIFIERS** (U) LIDAR, Lithium niobates, Optical parametric oscillators, Optical parametric oscillators, PEG280F, WARESC1002007

**ABSTRACT** (U) Low viscosity, two component epoxy resins were formulated for air spray application over quartz or dolomite aggregates. The formulation selected for full evaluation was based on mercaptan curing systems. Trifunctional mercapto monomers were used in some formulations as modifiers. The resulting polymer concrete set up within 3 to 4 minutes after mixing at temperatures around 73 degrees F. Concrete cured within 12 hours of mixing and in dry environments down to -25 degrees C. Good adhesion to wet aggregate requires the use of coupling agents, organofunctional silanes being preferred. Good bonding to asphalt and Portland cement concrete and good shear characteristics were demonstrated. Flexural strength properties are satisfactory after cure down both under dry and wet application conditions. While the polymer concrete is not due to the exotherm of the curing reaction, flexural strength properties are low. (Author)

**DESCRIPTORS** (U) \*Epoxy, \*Monomers, \*Concrete, \*Cements, \*Asphalt, \*Adhesives, \*Adhesive, \*Polymers, \*Curing, \*Adhesive bonding, \*Formation (Chemical), \*Mechanical properties, \*Epoxy resins, \*Silanes, \*Titans

**IDENTIFIERS** (U) WARESC1007801, PEG1101F

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## UNCLASSIFIED REPORT

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GTIC REPORT BIBLIOGRAPHY

AD-A09C 200 14/2 21/5 13/2 SEARCH CONTROL NO 05602R  
ACUREX CORP. MAINTAIN VIEW CA ENERGY AND ENVIRONMENTAL DIV CONTINUED  
(U) An automaticokinetic Sampler for Particulate Emissions from Aircraft Gas Turbine Engines  
DESCRIPTION NOTE final rept. for 75-Jan-76.  
JAN 69 37P PERSONAL AUTHORS Dehne, Hans Joachim.  
REPORT NO ACUREX-78-315  
CONTRACT NO N00123-75 C-1075  
PROJECT NO 1900  
TASK NO 2A  
HONOROR ALESCE/ESL/AESD  
TH-30-04 181-01-80

UNCLASSIFIED REPORT  
ABSTRACT (U) An automatedokinetic sampler for capturing particulate emissions from aircraft gas turbine engines has been constructed and tested. The sampler is capable of collecting the particulate emissions from gas turbine at the exit plane (non-afterburner operation) or gravimetric measurements and permits simultaneous on line particle size distribution measurements to be performed. The particle size distribution is located on a fiber glass filter for gravimetric measurement. The size distribution is determined by counting the gas turbine exhaust gases and parking flow through aability particulate size distribution sampler. The sampler has two automatically controlled capability and a system sampling capability of 128 l/min (g. sec), Test data are automatically recorded. Control of the sampler is by means of 12-bit micro computer. Performance tests were performed at the Naval Air Research Facility, Alameda, California, at various construction stages of the sampler to evaluate its performance and to measure the effects of (un) additives on particulate emissions on a TPF4<sup>2</sup> gas turbine engine (Author)  
DESCRIPTORS: (U) \*Samplers, Emission, \*Particulates.  
AD-A090 280

755  
\*Combustion products, \*Gas turbines, \*Turbofan engines, \*Aircraft engines, Air pollution, Supersonic flow, Fuel particle size, Distribution, Microprocessors, Fuel additives  
IDENTIFIERS: (U) Lookinot samplers, TF 41 engines  
WDAFFSC19002A11, PEB2B01F  
AD-A090 280  
PACD 321 05602R  
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AD-A089 008 CONTINUED  
IAC NO PL-03775  
IAC DOCUMENT TYPE PLASTIC - MICROFICHE --  
IAC SUBJECT TERMS P-10) Harvey, Inlays, Formulations,  
Epoxy, Repair, Spray Applications, Adhesion, Bonding,  
Polymer concrete, Flexural strength, Hardener, Stiffness,  
Coupling agents, Durability, Thermal conductivity, Epoxy  
810, Arachide 508, Cachire WR, Epon 812, Cycloaliphatics,  
field repairs, Airfield Pavements, Acrylics, PEMA, Cure  
monomer, Polyamides, 22 (Inhalated).

01C REPORT CILIATIONARY SEARCH COMING NO 05502A  
AD-A089 182 21/4 21/5  
GENERAL MOTORS CORP. INDIANAPOLIS IN DETROIT DIESEL  
ALTON DIV  
(U) Fuel Character Effects on Current, High Pressure Ratio  
Can-Type Turbine Combustion System  
DESCRIPTIVE NOTE Final rept Jan 78-Jun 78  
APR 10 1983P  
PERSONAL AUTHORS Vogel, Rodney E., Troth, Dennis L.,  
Vardouli, Athar J.  
REPORT NO DDA-EDR 9782  
CONTRACT NO Y30015-78 C 2008  
PROJECT NO 3048  
TASK NO 05  
INVENTOR AFAPL AFSC/ESL  
TR-78-2072, TR-79-29

UNCLASSIFIED REPORT

ABSTRACT (U) The effect of limited fuel property variation on the performance of current, high pressure ratio, can-type combustor evaluated. The fuel in the combustor was emulsion this combustor had conventional, this- orifice fuel injection and film cooling. The combustion  $\chi$  is approximately stoichiometric at takeoff. The combustion  $\chi$  is approximately stoichiometric at takeoff. Twelve experimental fuels, including JP-4 and JP-8 were tested. Distillation range, hydrogen content, and aromatic type were varied by blending JP-4 and JP-8 fuels with mineral seal oil and two types of aromatic solvents. Performance tests were accomplished at idle, altitude cruise, and takeoff conditions. Sea level and altitude ignition tests were also completed. Fuel sooting and carbonizing characteristics were established. Combustor operating parameters such as "link" temperature, pattern factor, ignition fuel/fair ratio, lean blow out fuel/sir ratio, and exhaust emissions were correlated to fuel properties. The effect of fuel properties on combustor and turbine hardware durability was assessed analytically. (Author)

DESCRIPTORS (U) \*jet engine fuels, \*turbofan engines

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PAGE 123 055C20

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055026  
AD-A089 078 13/2 2 1/4 1/3

\*Combustors, Chemical composition, High pressure  
Particulate, Tests, Hydrogen, Aromatic hydrocarbons,  
Combustion, Sediment, Ignition, Emission, Carbon monoxide,  
Hydrocarbons, Nitrogen oxides

IDENTIFIERS (U) *T-41 engines, A-7U Attack aircraft, A-7E Attack aircraft, JP-4 fuels, JP-8 fuels, Can type  
consumers, WUSAFL-35460815, PEG2203F*

DESCRITIVE NOTE *Final technical rept Feb 72-Dec 72.*

MAR 80 184P

PERSONAL AUTHORS *Cleveland, Harvey J.*REPORT NO *AFFSC/ESL-TN-80-17-VOL-2*PROJECT NO *1900*TASK NO *4C*

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE *See also Volume 1, AD-A089 010*

ABSTRACT (U) An analysis of 3 1/2 years of data on fuel jettisoning by US Air Force aircraft was performed to provide the basis for an accurate assessment of the environmental effects associated with this practice. This volume contains complete listings of all reported fuel jettisons by Air Force aircraft for the period 1 Jan 75 through 30 Jun 76, sorted by Air Force command and by aircraft. A third section presents the distribution of fuel jettisoning by latitude and longitude coordinates (Author)

DESCRIPTORS (U) *Jet engine fuels, Jettisonable equipment, Air pollution, Environmental impact statement(s), Aircraft, Jet aircraft, Aviation fuels, Tablos (Data), Latitude, Longitude, Emission, Hydrocarbons, Contamination, Geographical distribution*

IDENTIFIERS (U) *WUSAFL-18094C02, PEG2203F*

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AD-A088 310 13/2

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

(U) PHENOLIC Wastewater Treatment Alternatives

DESCRIPTIVE NOTE Final report. Aug 79-Feb 80.

JUN 30 771P

PERSONAL AUTHORS Blum, Robert G.

REPORT NO AFSSC/ESL-TR-80-18

PROJECT NO 1820

TASK NO 70

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A088 310 CONTINUED

phenolic wastewater at the industrial or sanitary wastewater treatment plant, especially by ozone oxidation

DESCRIPTORS (U) Waste treatment, disposal, phenolic plastics, waste water, phenols, activated carbon, adsorption, catalysts, incinerators, oxidation, activated sludge processes, filtration, combustion, ozone, cost, effluent, industrial, industries, chlorinating environments, chemical cleaning, paints, cost analysis, cost eff., vendors

IDENTIFIER'S (U) Paint stripping, DEGWHOLF, MCAS/ESL-TR-80-18

JAC 119

PL-801718

JAC DOCUMENT TYPE PLASTIC - MICROFICHE --

JAC SUBJECT TERMS (U) Process, comparisons, treatment plants, cost analysis, waste waters, phenols, activated carbon, carbon adsorption, ozonation, oxidation, aeration, trickling filtration, incorporation, pyrolysis, industrial wastes, chemical wastes, sanitary landfills, degradation, hazardous wastes, paints, sludge, 22 M101, 22 Unlimited.

ABSTRACT. (U) The Air Force uses phenol compounds primarily in its paint stripping and carbon removal operations, the major portions of which are performed at the Air Logistics Centers (ALCs). Depending on the type of paint phenol either remains in the industrial/sanitary waste stream, or is removed and disposed of by a contractor. Several Air Force bases, particularly the ALCs, are experiencing difficulty in meeting increasingly stringent National Pollution Discharge Elimination System (NPDES) permit standards for phenols. In addition, regulations being promulgated under the Resource Conservation and Recovery Act (RCRA) will impact upon certain treatment and disposal practices. Therefore, the principal objective of this study is to determine the most cost-effective processes (or the treatment and disposal of these wastes in accordance with existing and proposed environmental regulations. A literature review is conducted which examines the following systems/processes: Granular Activated Carbon (GAC) adsorption, ozone, oxidation, hydrogen peroxide oxidation, potassium permanganate oxidation, iron (VI) ferrate oxidation, chemical oxidation, chlorine oxidation, chlorine dioxide oxidation, aeration, recovery, incineration, pyrolysis, landfilling, activated sludge, trickling filter, and source control. The results of the cost analyses show that biological processes are by far the most cost-effective alternative for the treatment of paint stripping wastewater at the source. Biological systems are also the most cost-effective for treatment of

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		DTIC REPORT BIBLIOGRAPHY		SEARCH CONTROL NO	055028
AD-A008 188	1/5	13/2	13/3	AD-A026 834	13/2
SOUTHWEST RESEARCH INST SAN ANTONIO TX ENGINEERING SC.ENCES DIV		SEARCH INC NORMAN OK		(U) Optimization and Test of the ozone Crystallite Waste Treatment System at Tinker Air Force Base	
(U) New Concept Study for Repair of Bombs-Damaged Runways Volume 1 Concept Identification		(U) Optimization and Test of the ozone Crystallite Waste Treatment System at Tinker Air Force Base		DESCRIPTIVE NOTE Final rept 14 Jul 78-30 Sep 79.	
DESCRIPTIVE NOTE final rept 1 May 71-24 Jul 78.		DESCRIPTIVE NOTE Final rept 14 Jul 78-30 Sep 79.		DESCRIPTIVE NOTE Final rept 14 Jul 78-30 Sep 79.	
SFP 79 188P		DEC 79 111P		DESCRIPTIVE NOTE Final rept 14 Jul 78-30 Sep 79.	
PERSONAL AUTHORS Baker, E. Jack , Dr. Barmann, Ernest P.		PERSONAL AUTHORS Steeborn, Leslie E. Schenck, Herbert M.		DESCRIPTIVE NOTE Final rept 14 Jul 78-30 Sep 79.	
REPORT NO 02-4801-VOL-1		CONTRACT NO FOR335-78-C-C2US		DESCRIPTIVE NOTE Final rept 14 Jul 78-30 Sep 79.	
CONTRACT NO FOR335 77 C-0154		PROJECT NO 2054		DESCRIPTIVE NOTE Final rept 14 Jul 78-30 Sep 79.	
PROJECT NO 2104		TASK NO 3W		DESCRIPTIVE NOTE Final rept 14 Jul 78-30 Sep 79.	
ASK NO 2B		MONITOR AFESC/ESL		DESCRIPTIVE NOTE Final rept 14 Jul 78-30 Sep 79.	
MONITOR AFESC/ESL		TR-79-4S		DESCRIPTIVE NOTE Final rept 14 Jul 78-30 Sep 79.	

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also VOLUME 2. AD-8C50 055L

ABSTRACT: (U) An in-depth review of bomb crater repair procedures and material resulted in the identification of primitive concepts. Each concept is a general solution to the problem of crater repair which attempts to fit into the environment using materials contributions of fill and cap materials. In addition to the study and description of repair processes, an in-depth review of alternate repair strategies is presented. (Author)

DESCRIPTORS: (U) (1) Bombs, bomb damage, keep-in, stabilization, storage, filling, capping, material, protective coatings, damage assessment  
(U) Alternatives to fill, assessment  
PER0723F

56

ABSTRACT: (U) A full-scale demonstration plant utilizing ozone/ultraviolet radiation for removal of cyanide from electropolishing wastes was optimized and tested at Tinker Air Force Base, Oklahoma. The original design goal was to reduce cyanide concentrations to nondetectable limits in a waste stream (0.25 g/liter per hour) containing up to 50,000 milligrams per liter cyanide. Study results are supplemented by a review of literature related to ozone oxidation. The report summarizes equipment, operational and plant design features identified and corrected major problems included compressors, breakers, over, insufficient air filters, inoperable dryers, inadequate ventilation, low power output from ozone generators, and an inefficient ozone contact system.

DESCRIPTORS: (U) Waste treatment, wastes (industrial), cyanides, ozone, optimization, test methods, ultraviolet radiation, oxidation, air filters, electropolishing, concentration (chemistry), generators, streams, compressors

IDENTIFIERS (U) PER04708F MUAFESC20543W70

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AD-A026 834

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AD NO85 185 218 1

AFK FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

NEW EXICO ENGINEERING RESEARCH INST ALBUQUERQUE

(U) Heating Techniques for Asphalt/Aggregate Mixtures

DESCRIPTIVE NOTE Final report Mar-Nov 79.

DTC 79 23P

PERSONAL AUTHORS Cressman, V.

REPORT NO FME91C AF-33

CONTRACT NO F29601 78-C-2015

MONITOR AFESC/EGL

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD NO85 185 218 1

AFK FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB(U) The Effects of Line Based Missiles Fuels on the  
Activated Sludge Process

DESCRIPTIVE NOTE Final report Jan 77-Jan 79.

DTC 79 107P

PERSONAL AUTHORS MacNaughton, Michael G., Farnham, J. Jr. A.

REPORT NO AFSC/ESI -TR-79-38

PROJECT NO A103

TASK NO 74

UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT (U) This report investigates conventional and  
recently developed equipment and methods used in the  
mixing and oiling of asphalt/aggregate mixtures.  
Recommendations are made for techniques to be developed  
which will meet the rapid repair time that is specified for  
Kirovograd, Soviet, and conventional heating equipment is  
examined to determine the most feasible method to pursue  
for optimal heating and fuel conservation (Author)DESCRIPTORS (U) Asphalt, Cement, Heating, "Scalar"  
Combining, Energy conservation, Mixtures, Microwaves,  
Pavements, Roadways, Literature surveys, Fuel economy  
standards, Pavilions, Heaters, Life cycle costs  
INSTITUTIONS (U) AggregateABSTRACT (U) The Air Force (AF) produces and uses based  
hydrazine fuels for use in Titan II and III, Minuteman  
III, Space and ground systems and also reservice for  
the procurement, storage, and transport of such fuel. In  
support of the National Aeronautics and Space  
Administration (NASA) and the AF Space Shuttle program  
(this report summarizes data on the effects of hydrazine  
(H2), monomethylhydrazine (MMH) and  
urea-methanol/dimethylhydrazine (UDMH) in conventional  
activated sludge systems for fuel-contaminated  
waste containing the fuels and for sludge doses from  
accidental spills. It was concluded from the continuous  
acid studies that the three hydrazines could cause  
significant deterioration of an activated sludge plant if  
the concentration in the influent exceeded a few mg/l  
for an aeration basin with a common hydraulic detention  
time of 9 hours, the efficiency of organic removal is  
seriously degraded when the influent concentration of H2  
exceeds 10 mg/l. For UDMH and MMH this total failure  
results at concentrations of approximately 1 mg/l and 5  
mg/l, respectively. Interpolating from these continuous  
acid studies, the 'no effect level' would be  
approximately 1 mg/l for H2 and 2 mg/l for MMH and UDMH.  
The influence of the hydrazines on oxygen saturation of  
the sewage treatment plant effluent is more pronounced  
in the sewage treatment plant effluent than in the nitrification  
of nitrification occurred at concentrations above 0.5 mg/l

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SEARCH CONTROL NO 055028

AD-A084 788 13/8 20/7

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CONTINUED

1 for 2084 and 1 ng/l for the other fuels

DESCRIPTORS (U) "Aerial fuels, "Gelled missiles, "Liquid rocket fuels, "Activated fluid process, Hydrazine, Storage Accidents, Detonation, Space shuttle, Spilling, Transportation, Environmental, Industrial plants, Carbon Oxidation, Nitration, Sewage treatment

IDENTITIES: (U) Missile fuels, PER87232F.

WUAPESC:1037884

ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND FORT MONMOUTH NJ

(U) Quartz Crystal Fabricator Facility

DESCRITIVE NOTE Final rep 1 Apr 77-30 Sep 79 on Phase 1.

MAY 80

NSP

PERSONAL AUTHORS May, R. J.

CONTRACT NO DF-AC04-76DP00936

UNCLASSIFIED REPORT

ABSTRACT (U) The report describes the design and operation of a five chamber, interconnected system, which is capable of cleaning, plating, and sealing precision quartz crystal units in ceramic flatpack enclosures continuously in a high vacuum environment. The production rate design goal was 200 units per eight hour day. A unique nozzle beam gold deposition source was developed to operate for extended periods of time without reloading. The source puts out a narrow beam of gold typically in the order of 2 1/2 deg included cone angle. Maximum deposition rates are in the order of 400 a/min at 5 in. throw distance but unquoted are 100 a/min at 10 in. throw distance used. Entrance and exit air lock chambers expedite the material throughput, so that the processing chambers are at high vacuum for extended periods of time. A stainless steel conveyor belt in conjunction with three vacuum manipulators, transport the resonator components to the various work stations. Individual chambers are normally de-ported from each other by gate valves. The crystal resonators, mounted in flatpack frames but unquoted are loaded into transport trays in a first-in-first-out sequence for insertion into the system and exit air circulated crystal units. The system utilizes an indium coated ball bearings at axially all friction surfaces. The gold source and plating mask heads are equipped with elevators and gate valves, so that they can be removed from the system for maintenance without exposing the chambers to atmosphere.

DESCRIPTORS (U) Quartz resonators, Fabrication, Vacuum apparatus, Production control, Precision finishing, Military application, Specifications, Ceramic materials, Flat pack circuitry, Encapsulation, Cleaning, Plating

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AD A084 788 CONFIDENTIAL  
 Sealed Systems Industrial protection test facilities,  
 Cryogenics, Cryocells

## IC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 058028

AD A084 783 13/8

HARD CORP MEDINA OH

## (U) Evaluation of Cathodic protection Criteria

DESCRIPTIVE NOTE Final rep 1 Jul 78 Apr 79

DEC 79 85P

PERSONAL AUTHORS Hassock, Bernard ,

CONTRACT NO FOR835 17 C-0248

PROJECT NO 2104

TASK NO 5C

MONITOR AFESC/ESL

TR 79 14

## UNCLASSIFIED REPORT

ABSTRACT (U) This report summarizes the results of a study undertaken to provide an in-depth evaluation of four principal cathodic protection (CP) criteria used for underground and underwater metallic structures. All of the criteria considered make use of structure-to-soil potential measurements. The intent of the report is to provide the background necessary for selecting the proper criterion for a given situation and to remove the misconceptions of eight often erroneous guidelines provided for correct placement of the reference electrode with respect to the structure being treated. It is also determined how many potential measurements are sufficient. Explanations are given concerning the various voltage (IR) drops which are encountered and instruction is given on how those IR drops are to be considered. It must be understood that there are too many variables to allow for general, all-inclusive statements regarding criteria for Cathodic protection. Each application must be reviewed individually using the experience from other similar applications together with the information in this report.

INSCRIPTORS (U) \*Cathodic protection, pipelines  
 \*Corrosion inhibition \*Standards Measurement  
 Underwater structures Underground structures Metals  
 Electrodes Voltage

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AD A084 783

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AD-A084 783 CONTINUED DTIC REPORT 018LIGRAPHY SEARCH CONTROL NO 055028  
 IDENTIFIERS (U) Corrosion, Pipe to soil protection  
 Volition drops, Metallic structures, Reference electrodes,  
 PERT3735, WUESI, 1045C01

MASSACHUSETTS INST OF TECH LEXINGTON LINCOLN LAB  
 (U) Remote Sensing of Turbulent Engine Gases  
 DESCRIPTIVE NOTE Final rept 15 JUL 78-30 SEP 79.

SEP 79 84P  
 PERSONAL AUTHOR(S) Horowitz, Aram, Kizilgur, Dennis K.  
 Remy, K. Nusman.

CONTRACT NO F19628-78-C-0002

PROJECT NO 1900

MONITOR EST, ARSEC/ESL  
 TR-78-319, TR 50 09

## UNCLASSIFIED REPORT

ABSTRACT (U) This document is the final report for a laser remote sensing research program. The research conducted was designed to develop and demonstrate laser remote sensing techniques for monitoring jet aircraft exhaust gases. This effort was part of a larger program to develop remote sensing techniques for environmental monitoring and therefore detection and discrimination. The specific tasks which were performed consisted of the following: (1) development of an improved repetition rate miniature CO<sub>2</sub> TEA laser and incorporation into a differential absorption LIDAR(DIAL) system; (2) laboratory demonstration of the frequency doubled CO<sub>2</sub> TEA laser system by different: (a) absorption measurements of known gas samples (CO and NO), and (3) initial field feasibility demonstration of laser remote detection of CO in vehicular exhausts (automobile, tractor, motor and Skydrive helicopter) as ranges up to 2.5 km. Each of these tasks is described in detail in the following sections of this report. In addition, supporting documentation is included in the accompanying appendices.

DESCRIPTORS (U) \*TEA lasers, \*exhaust gases, \*jet engines, \*carbon monoxide, \*Helicopter engines, \*gas turbines, \*automotive vehicles, \*Aircraft engines, Atmospheres, Atmospheric chemistry

(U) Nitrogen oxides, Ethylene, Ozone

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Methyl Alcohol Combustion PROBES/01

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SEARCH CONTROL NO 058628  
AD A084 426 13/2 21/9 1  
AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES 1/2A  
(II) Biological Degradation of Hydrazine  
DESCRIPTIVE NOTE Final rept Jun 77-A-9 78  
OCT 78 AF  
PERSONAL AUTHORS MacNaughton, Michael G.; Fitzgerald, Jay A.  
McDaniels, Larry; Urde, Gregory.  
REPORT NO AFESC/ESL-TR-78-30  
PROJECT NO 2103  
TASK NO 7W  
MONITOR CESDO  
TR-78-13

## UNCLASSIFIED REPORT

ABSTRACT (II) Due to the increased procurement, storage and transportation of hydrazine (HZ) in support of the flight and Humanitarian operational mission, the Space Shuttle and F104 combat fighter programs, the Air Force Flying Training and Service Laboratory has been tasked with documenting the effects of fuel spills and low level contractor tank blow discharges on publicly owned treatment works (POTW). Using 12 bench scale continuous flow recircule reactors, it was shown that treatment efficiency (as measured by COD removal) is not seriously impaired for drug doses which increase aeration basin HZ concentrations up to 40 mg/l. Chemical oxygen demand (COD) recovery times for slug doses of 243 mg/l were approximately 4 to 5 days. Nitritation was found at HZ concentrations above 23 mg/l. The fact that no nitrate concentration with respect to ammonia oxidation was determined to be between 1 to 23 mg/l while nitrate recovery times for doses up to 243 mg/l were on the order of 10 days. Continuous influent HZ concentrations above 1 mg/l seriously degrade COD removal capabilities. Nitritation under continuous feed conditions was inhibited above 1 mg/l.

DESCRIPTORS (II) "Hydrazine", Activated sludge process  
Air Force facilities Sewage treatment  
AD A084 426

AD A084 544

UNCLASSIFIED

PAGE .32 058628

## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 095028

AD A082 938 13-12

AD-A084 420 CONTINUED

Concentration(Chemistry), Effluents, Continuous Processing, Blockade, Degradation, Inhibition, Discharge, Oxygen demand, Water pollution statement, Nitrogen, Toxicity, Recovery

Water pollution statement, Nitrogen, Toxicity, Recovery

IDENTIFIERS (U) H�troducer, Nitrosoximes, Fuel spills, Nitration, PEG3725F, WAKE52010371P4

TAC NO PL-901719

TAC DOCUMENT TYPE PLASTIC HARO COPY

TAC SUBJECT TERMS P- (U)Resource recovery, Toxicity, Blockade, Degradation, Inhibition, Discharge, Water pollution statement, Effluents, COD, BOD, Nitrogen, Fuel spills, Power plants, Treatment Plants, Industrial wastes, Sludge 22 MTCO, 22 Unlimited

TAC

TYPE

HARO

COPY

REPORT NO FA-A-N-7B-43

CONTRACT NO DTIC-8-114

MONITOR AFES/FSL

TR-75 40

## UNCLASSIFIED REPORT

ABSTRACT (U) The objective of this effort was to establish the feasibility of replacing a potentially lethal aircraft cabin environment with a coel habitable atmosphere which is noncombustive or combustible during passenger evacuation in fire emergencies. For this purpose, carbon tetrachloride (CT4) was chosen as the fire extinguishant because of its very low toxicity and high molecular stability under thermal insults. Full scale experiments were performed in the complete aircraft cabin of a DC-3 aircraft employing both Class A and B combustible materials. Three experiments were performed using the habitable inert atmosphere (27 volume percent CT4) discharging at the rate of 3,300 cubic feet per minute into the aircraft cabin through a window exit for comparative purposes. The fourth experiment was performed using neat CT4 discharged from two simulated points of fuselage penetration by a ballistically-powered aircraft skin penetrator nozzle. Both of these prototype fire extinguishing systems were designed to be employed by a airport crash fire-rescue services to extinguish aircraft cabin and compartment fires.

DESCRIPTIONS (U) (a) Fire fighting, fire extinguishing agents, (b) Carbon tetrachloride, Aircraft cabins, Aircraft fires, Emergencies, Combustion, Crashes, Environments, Atmospheres, Fireability studies, Fireant

AD-A084 420

AD A082 938

UNCLASSIFIED

DTIC 323 055028

## UNCLASSIFIED

AD-A082 036 CONTRIVED  
**Stability, Toxicity, Low Level, Stabilization, Rare Gases**  
 IDENTIFIERS (U) Advanced systems, Advanced concepts,  
 Cabin fire, Countermeasures, Advanced concepts.

DTIC REPORT DIAL LOGOGRAPH

SEARCH CONTROL NO 05502C

AD-A082 340

13/2

AIAA-AUG-ENGINEERING AND SERVICES CENTER TRAILER AND F1,  
 ENGINEERING AND SERVICES 1, AIR(U) Development of a Pavement Maintenance Management  
 System, Volume VII: Maintenance and Repair, Consequence  
 Models and Management Information Requirements

DESCRIPTIVE NOTE Interim rev. Sep 77-dkl 79.

DEC 79

1979P

PERSONAL AUTHORS Shahin, Mohamed Y., Darter, Richard L.,  
 Cason, Thomas T.

REPORT NO AFIS/C/SSL-TR-79-18-VOL 7

PROJECT NO 20254

TASK NO 20244P

## UNCLASSIFIED REPORT

ABSTRACT (U) Statistical prediction models for pavements  
 condition (Index PCI) and key distresses have been developed  
 for asphalt and jointed concrete pavements. The  
 models were developed based on field data collected  
 during 1976 through 1978 from 10 airfields throughout the  
 United States. The field data included traffic, climate,  
 pavement structure and material properties, and previous  
 maintenance. Prediction models were developed for  
 concrete and asphalt pavements, respectively. These  
 models represent the first iteration of the consequence  
 models needed to help pavement engineers select the most  
 economical maintenance and repair (MAR) strategies and to  
 help management efficiently allocate repair funds. Two  
 workshops were held to determine information required by  
 Air Force Command and Base Engineering managers to efficiently  
 manage airfield pavement MAR. The workshops were attended  
 by many Command and Base engineers, as well as  
 representatives from the Air Force Design Center and the  
 Directorate of Management Systems. Computer and  
 information requirements were defined and implementation  
 alternatives for a computer aided pavement management  
 system were developed as a result of these workshops  
 (Author)

DESCRIPTORS (U) Pavements, Maintenance, Management  
 Information Systems, Models, Repair, Concrete, Asphalt

AD-A082 340

AD-A082 030

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## UNCLASSIFIED

AD-A082 340 CONTINUED

Climate, Structures, Predictions, Requirements, United States, Feronomics, Budgets, Computer Applications, Data Processing, Statistical analysis.

IDENTIFIERS (U) LPA-DIC-B-28, P29408F, MAFFSC-2054AP15

## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 085028

AD-A081 707 13/8

AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

(U) Freeze Protection for Impressed-Current Cathodic Protection Anodes in Water Storage Tanks

DESCRIPTIVE NOTE Final rep Jan 78-Dec 78.

OFC 79 43P

PERSONAL AUTHOR: Girard, Roger J.; Meyers, James R.

REPORT NO: AFESC/ESL-TR-79-36

PROJECT NO: 2102

TASK NO: 40

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Rep no AFCEC-ER 75-0  
dated Apr 75

## ABSTRACT

(U) A technique was developed for supporting anode assemblies from the bottom of water storage tanks using polyester-type fiberglass vertical columns. The columns were readily fabricated from the lignite lignite, non-metallic material; button-type anodes were easily positioned on the columns. The columns were supported in the tank by steel bases welded to the tank bottom. This was a unique departure from conventional, impressed-current type anode assemblies, are conventionally suspended from the roof of the tank using techniques which subject them to damage during the winter ice icing conditions. It was stabilized that the non-metallic, bottom-supported anode system was a viable approach for supporting anode assemblies in water storage tanks where severe icing occurs. Horizontal supports should not be connected between the columns and the tank wall. Equally important, it was found that header cables to the anodes and permanent reference electrode assemblies could be effectively protected from ice damage by encasing them in polyvinyl chloride conduit anchored to the tank surface (author)

DESCRIPTORS (U) \*Cathodic protection. \*Anodic coatings. \*Freezing. \*Water tanks. Storage tanks. Icing formation. Roots. \*Anodes. Fiberglass. Surfaces. Electrodes.

AD-A082 340

## UNCLASSIFIED

PAGE 315 085028

## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

STARCH CONTROL NO. 055028

AD A091 707

CONTINFO

Cables, Polyvinyl chloride  
(U) freeze protection

MUFESC21024004

PE83737F

IDENTIFIERS

(U) Solar Insolation Recording System (SIRS) Reference

X-101

ENGINEERING AND SERVICES LAB

AIR FORCE ENGINEERING AND SERVICES CENTER SYNDALL AFB FL

LAC NO. PI-030478

IAC SUBJECT TERMS

P-1-(U) Composites, Electrolysis,  
Storage tanks, fiberglass/polyester, Polystyrene,  
Corrosion resistance, Refining, 22 United States

IAC DOCUMENT TYPE

MASTR - MICROFICHE

DESCRITIVE NOTE

In-situ rept Jan 77-Dec 78.

DEC 79

56P

PERSONAL AUTHORS

Shapleton, Edward E., Mantz, Michael R.

(U)

REPORT NO.

AFSC/FSL-TR-78-34

PROJECT NO.

2054

TASK NO.

50

## UNCLASSIFIED REPORT

**ABSTRACT** (U) This manual provides the installation procedures, theory of operation, and maintenance procedures necessary to install, operate, calibrate, maintain and understand the Solar Insolation Recording System (SIRS) which is a microcomputer-based data acquisition system used to collect solar insolation data from a strip chart. Large quantities of data were particularly difficult to manipulate therefore to simplify the processing of data, a data acquisition system was designed and built which produced a computer compatible data medium. In the case of SIRS, the data media is digital cassette tapes. These tapes can be read into a larger computer where complex data manipulation/processing can be accomplished. This document addresses the data acquisition system to a reduction and manipulation will be covered in the final technical report on Solar Radiation Measuring (Author).

**DESCRIPTIONS** (U) Solar radiation, Data acquisition, Pyranometer's, Integrators(Computers), Microcomputer's, Digital recording systems, Data displays, Cassettes

IDF41121RS (U) WSAFFSC2056008 RE847084

AD-A081 707

AD A060 404

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UNCLASSIFIED

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AU-A079 747 1/5  
NEW MEXICO UNIV/ ALBUQUERQUE ERIC II MAND CIVIL  
ENGINEERING RESEARCH FACILITY  
(U) Predicting the Fatigue Life of Flexible Airfield  
Pavements - A Recommended Approach

DESCRIPTIVE NOTE Final rept JNL 78-JUN 79.

JNL 79 123P

PERSONAL AUTHORS Decker, Dale S.

CONTRACT NO F28601-78-C-0015

PROJECT NO 2104

TASK NO 1A

MONITOR AFSC/ESI  
TR 79-2N

UNCLASSIFIED REPORT

ABSTRACT (U) The pavement engineer currently has no realistic means of predicting the fatigue life of an existing asphalt pavement or the service life of a new asphalt pavement surface. The development of information that would enable engineers to make realistic fatigue life predictions, and thereby to make the best use of the increasingly scarce pavement maintenance dollar, is critically needed. This report reviews current fatigue and rutting design test methods and examines the service life of materials and environmental condition on asphalt life. The extensive literature review indicates a possibility that fatigue life may be estimated by correlating known fatigue parameters with results of routine design tests. The repeated load indirect tensile (fatigue) test and the resilient modulus indirect tensile (routine design) test are recommended for use in US Air Force investigations.

DESCRIPTORS (U) Pavement life, Test methods, Asphalt, Life expectancy, Mathematical prediction, Loads (forces), Fatigue tests (Mechanics), Stress testing, Environments

IDENTIFIERS (U) Aggregate (Materials), WEST 2161A23  
PE63725F

AD-A079 747

AD-A079 556

UNCLASSIFIED

SEARCH CONTROL NO 09026

AD-A079 956 15/5 G/2

SRI INTERNATIONAL MENLO PARK CA

(U) User Guide for the Air Force Base Automotive  
Transportation Simulation Model - BATS Volume 3  
Documentation, Appendices D and E

DESCRIPTIVE NOTE Final rept Jun 78-SEP 78

SEP 79 223P

PERSONAL AUTHORS Sardys, Richard ,

CONTRACT NO F08035-78-D-0132

MONITOR AFSC/ESI  
TR-78-1B-Vol 3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 1 AD-A079 328

ABSTRACT (U) For abstract see AD-A079 655

DESCRIPTORS (U) Air Force facilities, Ground traffic  
air quality, Exhaust fumes, Computerized simulation,  
Computer programs, Output, Oklahoma, Arizona

IDENTIFIERS (U) Tinker Air Force Base, Davis-Monthan  
Air Force Base, Air Force Base, Davis-Monthan  
Simulation, AFSC/ESI, Air Force Automotive Transportation  
Simulation, AFSC/ESI Quality Management Model

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UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 058023

AD-A079 655 15/5 9/2  
SRI INTERNATIONAL MENLO PARK CA  
Air Force Engineering and Services Center TYNDALL AFB FL  
Engineering and Services Lab

(U) User Guide for the Air Force Base Automatic  
Transportation Simulation Model - BATS Version 2  
Documentation

DESCRIPTIVE NOTE Final rept Jun 78-Sep 79.

SEP 79

14RP

PERSONAL AUTHORS Sandys, Richard .

CONTRACT NO F08035 78-D 0132

MONITOR AFSC/ESL

TR 78-10-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 3, Appendices D-5  
AD-A079 656

AD-A079 655 The BATS Automatic Transportation  
Simulation (BATS) Model is a transportation planning and  
traffic flow model designed to simulate traffic volumes  
and flows on an air base. The principal model inputs are  
road network, land use zones, demographic variables, and  
gate counts. The land use zones and demographic variables  
are used to assign volumes to the road network, and these  
volumes are calibrated using the gate counts. The flow  
characteristics on each road in the network are simulated  
using the volumes assigned. Average speed and volumes are  
the results of the model, and those may be directly input  
to the Air Quality Assessment Model (AQAM) to estimate  
pollution generation and dispersion from traffic sources.  
A volume flow plot of the network is an optional output  
of the model. (Author)

DESCRIPTIONS (U) Air Force facilities, ground traffic,  
air quality, exhaust gases, Computerized simulation,  
Data reduction, Input, Computer programs, Subroutines,  
Computer program documentation

IDENTIFIERS (U) BATS (Base Automatic Transportation  
Simulation), Air Quality Assessment Model;

AD A079 555

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 058023

AD-A079 413 9/18  
AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
Engineering and Services Lab

(U) Physiological limits of firefighters

DESCRIPTIVE NOTE Final rept Oct 77-Jan 79  
JMN 78  
RAP

PERSONAL AUTHORS Kyhne L G , Holman R D , Dungsartha ,  
Foley , Tucker D .

REPORT NO AFSC/ESL-TP 73-08

PROJECT NO 414N

TASK NO 30

UNCLASSIFIED REPORT

ABSTRACT (U) The U S Air Force School of Aerospace  
Medicine conducted a study of respiratory stresses  
imposed on firefighters wearing a suit contained  
breathing apparatus. The purpose of this study was to  
investigate the respiration, respiratory stresses and subsequent  
changes in work capacity accompanying the wearing of a  
self contained breathing apparatus (SCBA). Twenty  
volunteer subjects, ranging in age from 25 to 49 years,  
participated in the study which included both smokers and  
non-smokers of varying levels of physical fitness. A 30  
minute SCBA, developed with full face mask and either a  
(1) demand or (2) pressure demand regulator, was worn by  
the subjects while walking on a motor driven transmill at  
a constant speed (3.3 mph) and up grades determined to  
require 50, 65 and 80 percent of each individual's  
aerobic capacity (VO<sub>2</sub> max). Following a 10 minute rest  
venous blood was drawn for Hb, Hct %, CO<sub>2</sub>, and lactate  
determinations, the subject then began a 10 minute bout  
of work at one of the three work loads given above.  
Measurement of heart rate, continuously varying work included  
forehead skin, core and rectal temperatures, maximum and  
minimum O<sub>2</sub> and CO<sub>2</sub> tensions in the mask, breathing  
resistance (pressure), and heart rate (ECG)

DESCRIPTORS (U) Stress physiology, Fire fighting,  
breathing apparatus, Respiration physiology, Heart rate, Electrocardiography  
Physical fitness, Heart rate, Electrocardiography

AD-A079 413

AD-A079 413

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14RP: ASSISTED

UNCLASSIFIED

AD A079 413 COMINUED  
INITIATORS (U) Firefighters LPN-RFCEC-77 100,  
WURFORD & ANDREW PEG-7145

ORIC REPORT 61B10GRAPHY SEARCH CONTROL NO 053623

AD-A079 320 15/5 \$/2

SRI INTERNATIONAL - MENLO PARK CA

(U) User Guide for Air Force Base Automotive  
Transportation Simulation Model -BATS Volume 1 Date  
Collection and Reduction

DESCRIPTIVE NOTE Final rept. Jun 78-Sep 78.

SEP 78 180P

PERSONAL AUTHOR(S) Geoffrey-Arms (POM), Marilyn, Shope, Susan,  
Seney, Richard.  
CONTRACT NO F08035 78-D-0132

MONITOR AFESC/ESL  
TR-79-1B-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NO 15 See also Volume 2. AD-A079 555

ABSTRACT (U) This user guide describes the collection  
and preparation of information required by the Base  
Automotive Transportation Simulation (BATS) computer  
model. The BATS model predicts traffic volumes on an Air  
Force installation's roadway network using land-use,  
transportation and demographic data. The data collection  
procedure is presented in a step-by-step format with  
information sources clearly identified. The data  
collection procedure is divided into discrete tasks so  
that the information can be collected at different time  
periods. A master checklist enables a supervisor to  
efficiently manage the data collection tasks for the  
personnel available. The entire data reduction and  
encoding procedure to create a BATS input computer card  
check list is also explained (Author)

SECRET//NOFORN (U) \*Air Force facilities. \*Ground traffic.  
Computerized simulation. Input. Data reduction. Coding.  
Punched cards

IDENTIFIERS (U) BATS (Base Automotive Transportation  
Simulation)

AD A079 415

AD-A079 320

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AD 374 71P - 1/5 15/2 15/2  
THE INSTITUTE CONSULTANTS, GAINESVILLE, FL  
(U) Axial Filter Testing Test for Standard Jet Engine  
Test Cell Arrangement

UNCLASSIFIED REPORT  
AUG 18 44P  
PERSONAL AUTHORS Lundgren, Date A  
COMTRACT NO. F03617-78-M-0 84  
PROJECT NO. 1800  
TASK NO. 70  
MANITOR AFEC/EST  
TR-78 28

UNCLASSIFIED REPORT

ABSTRACT (U) The Air Force routinely tests turbine engines in fixed test cells, some of which have been cited by State pollution control officials for violations of opacity regulations. A previous report (for study, CEDR TR-7-33, predicted that the relatively low efficiency and high cost techniques could bring jet engine test cells into compliance with air pollution regulations. The system proposed included a water cooling spray and a mist separator followed by a medium efficiency, high velocity throwaway type glass filter media. The most serious limitation of which velocity filtration is the aerosol mass loading the potential for rapid pressure drop build up across the filter. Since filter loading characteristics could not be theoretically predicted, the objective of this follow-on work was to experimentally test and report the filter loading characteristics of three different fiber filters for application to jet engine test cell exhaust plume opacity control. Two types of glass fiber media were tested: (1) two different medium efficiency pre filter media, and (2) two different high efficiency fine filter media.

DISCRIPTORS (U) (1) The authors' test facility, "Air Pollution, Filters, Glass fibers, Pollution abatement, Smoke, Aerosols, Opacity, Sprays

AD 378 70

AD A078 779

REF ID: A251126

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ATYC REPORT CIBLIOGRAPHY

STARCH CONTROL NO 0E0028

CONTINUED

AD-A078 440 21/5 21/4

GENERAL ELECTRIC OR CINCINNATI OH AIRCRAFT ENGINE GROUP  
(U) Evaluation of Fuel Character Effects on J79 Engine  
Combustion System

DESCRIPTIVE NOTE: Final technical rept 7 Jun 77-31 Aug  
78.

JOAN 78 188P

PERSONAL AUTHORS: Gleason, C. C., Oliver, T. L., Sheayach,  
N. W.; Bahr, D. W.

REPORT NO. R79EG0321

CONTRACT NO. F33618 77-C-2042

PROJECT NO. 3048

TASK NO. 05

MONITOR: AFAPL, AFEDO  
TR-78-2015, TR-70 08

UNCLASSIFIED REPORT

AMEMAC (U) Results of a program to determine the  
effects of broad variations in fuel properties on the  
performance, emissions, and durability of the J79-17A  
turbojet engine continue from previous experiments.  
Combustor tests conducted at engine idle (all valves),  
austromic cruise, supersonic cruise, and off-ground start,  
and altitude cruise, supporting conditions with 13  
different fuels are described. The fuels covered a  
range in hydrogen content (0.0 to 14.5 percent)  
and in type (monocyclic and bicyclic), initial boiling  
point (265 to 300 K), final boiling point (552 to 679 K)  
and viscosity (0.05 to 2.25 mm<sup>2</sup>/s at 300 K). At high  
power operating conditions, fuel properties were  
found to be very significant fuel property with respect  
to linear momentum flows, ignition, smoke, and NO sub-  
<sup>5.7</sup> x emission levels. Carbon monoxide and NO emissions were  
very low at these conditions with all of the propellants. At  
engine idle operating conditions, CO, HC, and NO sub-  
x emission levels were found to be independent of fuel  
hydrocarbon content, but a small effect of fuel volatility  
and/or viscosity was found at cold day ground start  
conditions. At 320 K, ignition was obtained with all

fuels, but the required fuel-air ratio increased with the  
more viscous fuels. At altitude conditions, the current  
aeroburner fueling limits with JP-4/IP-5 fuel were  
severely affected, or exceeded with all of the JP-4 or JP-4  
based fuel blends. However, a very significant reduction  
in altitude refight capability was found when a No 2  
diesel fuel was tested.

DESCRIPTORS: (d) Turbojet engines, Jet engine fuels,  
Diesel fuels, Combustion, Chemistry, Hydrogen,  
Concentration (Chemistry), Aromatic compounds, physical  
properties, Boiling point, Nitrogen oxides, Emission,  
fuel air ratio, life expectancy

INCIDENT: 1ERS (U)  
117-F/APL3C 180481  
J-78-17A turbojet engines, PE02203F.

AD-A078 440

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 2259C-8  
AD-A078 118 10/3 21/4 21/1  
GENERAL ELECTRIC CO CINCINNATI OH AIRCRAFT ENGINE GROUP  
(U) Evaluation of Fuel Characteristics Effects on F101  
Engine Combustion Systems

DESCRIPTIVE NOTE Final technical rept 1 Aug 77. 0 Jap  
78.

JUN 78

199P

PERSONAL AUTHORS Gleason, O C, Oller, T L, Shayeson  
H W, Baird, D W  
REPORT NO R79REG05  
CONTRACT NO F33615-77-C-2043  
PROJECT NO 2048  
TASK NO 05  
MONITOR AFAPL-CELO  
TR-9-2016.1R-78-07

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 2, AD-A042 322L

ABSTRACT (U) As a result of increasing fuel costs and decreasing reserves, the USAF is studying the possibility of providing power to remote sites by means of alternate energy sources. Remote sites are identified and categorized. Several alternate energy sources are examined with respect to reliability, maintainability, and survivability against natural and man-made threats. Energy storage devices are also studied, and a final energy storage device is developed which relates these findings. (Author)

DESCRIPTIONS (U) Power supplies. Solar cells.  
Electric batteries. Auxiliary power plants.

Survivability analysis. Early warning systems.

Threats. Reliability. Remote areas. Early warning systems.

DESCRIPTIVE NOTE Final technical report 1 Aug 77. 0 Jap  
78.  
UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE Includes Addendum  
ABSTRACT (U) Results of a program to determine the effects of broad variations in fuel properties on the performance, emissions and durability of the General Electric F101 augmented turboshaft engine main combustion system are presented. Combustor rig tests conducted at engine idle, takeoff, cruise, dash, hold, day ground start and altitude flight operating conditions with 13 different fuels are described. Fuel nozzle durability tests conducted with the same fuels are also described. The test fuels covered a range of hydrogen content (12.0 to 14.5%), aromatic type (benzene, toluene, xylene, initial boiling point (245 to 383 °F), final boiling point (552 to 679 K) and viscosity (1.83 to 3.27 millistokes, 2/5 at 200 °K). At high power conditions, fuel hydrogen content was found to have a very significant effect. In low temperature, start and hold tests, where smoke levels decreased with increasing hydrogen content, the levels were very low with all the fuels. At idle conditions, CO and HC levels correlated with fuel ionization/volatility parameters, but showed no relationship to hydrogen

AD-A077 680

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AD-A078 118

## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

AD-A077 860 CONTINUED

SEARCH CONTROL NO 055028

AD-A075 947 13/2 21/5

concent. Cold day. Ground start and altitude relight also correlated with fuel atomization/volatility parameters, but showed no dependence on hydrogen/volatility parameters. First life studies yielded relative life predictions of 1.00, 0.74, 0.52, and 0.47 for fuel hydrogen contents of 14, 5, 14, 0, 13, 0, and 12.0 percent, respectively. At the present state of turbine stator development, no fuel effect on life is predicted. Extended cyclic fuel nozzle valve sampling tests revealed significant effects of fuel type and temperature on nozzle life. The results correlated with laboratory thermal stability ratings of the fuels based on tube deposits alone. (Author)

DESCRIPTORS: (U) Just engine fuels. Combustion. Test methods. Thermal stability. Chemical analysis. Physical properties. Cyclic tests. Parameters. Life expectancy. Computations. Combustors. High pressure. Viscosity. Combustion products. Carbon black. Nozzles. Valves. Experimental data. Hydrogen. Latition. Smoke. Cold weather tests

IDENTIFIERS (U) Combustion parameters. DE02203F. WKAFL03040804

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AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

(U) Control of Particulate Emissions from Turbine Engine  
Test Cells by Cooling Water Injection

DESCRIPTIVE NOTE final rept Feb-May 79.

JUL 79 77P

PERSONAL AUTHORS Haenraught, Michael G. ; Terrington, J. Martino Joseph A.

REPORT NO AFSC/ESL/TR-79-13

PROJECT NO 1900

REPORT NO 20

## UNCLASSIFIED REPORT

ABSTRACT (U) The operation of DOD turbine engine test cells in California has been criticized by the State environmental regulatory agencies because smoke generated by some engines results in excessive opacity (visibility) of the test cell exhaust plume. Since the plume exceeds visibility standards for only a relatively small proportion of engines tested, an cost control technique which brings the test cell into compliance with opacity standards is required. This study was initiated to verify that, in addition to forming a clean plume, water used to cool the test cell walls also removes smoke generated particulates and substantiates this procedure as a legitimate pollution control technique. It can be concluded from this study that water injection as practiced at McClellan AFB test cell results in significant (approx 50% by weight) control of turbine engine particulate emissions. It is postulated that the process could be made more efficient by the use of better designed spray nozzles which would increase water droplet particle contact and inclusion of a demister to increase water removal from the exhaust

DESCRIPTORS (U) \*Air pollution control equipment. \*Turbojet engines. \*Exhaust plumes. \*Water injection. Test equipment. Particulates. Air pollution. Environmental impact statements. Emission. Spray nozzles. Water cooling

AD-A077 860

UNCLASSIFIED

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AD A075 947 CONTINUED  
ID-NOTIFIERS (U) PE020001F MITSI 19002015

DTIC REPORT BIBLIOGRAPHY  
SEARCH CONTROL NO 055026  
AD A074 870 21/2 21/4 7/2  
DAYTON UNIV OHIO  
(U) Soot Control by Fuel Additives - A review  
DESCRIPTIVE NOTE Final technical rept 1 Jun 1 Oct 78  
SEP 78 41P

PERSONAL AUTHORS Howard, Jack B., Kausch, William J.  
CONTRACT NO F33613-77-C-2069  
PROJECT NO 3605 1900  
TASK NO 41, 40  
MONITOR AFES/ESTL  
TR 79-32

UNCLASSIFIED REPORT

ABSTRACT (U) A review of studies conducted in practical combustion systems such as oil-fired domestic and utility boilers, gas turbines, and diesel engines has demonstrated that metallic fuel additive can be effective in reducing soot emissions. Manganese iron and barium are the metals most often reported to be highly effective, although problems with metal oxide deposits on combustor surfaces sometimes prohibit their use. Evaluation of laboratory burner flame experiments revealed three distinct mechanisms by which the various metallic additives function to remove soot. Several mathematical models of soot reduction through jetting use dispersed iron additives and their combustion products are relatively non-toxic, whereas the popular manganese additives and their oxides are fairly hazardous generally only water soluble. Barium compounds are toxic and these may partially constitute only 45 percent of the barium compounds in diesel engine exhaust. Additives are only recommended for short term use, combustor design modifications being the economically preferred long term solution (Author)

DESCRIPTORS (U) Smoke, Control additives, Combustion additives, Combustors, Combustion deposits, Combustion products, Boilers, Gas turbines, Diesel engines, Metal compounds, Reduction, Oxides, Emissions, Manganese, Barium, Iron, Manganese, Barium, metals, hazards (Author)

AD A075 947

AD A074 870

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## UNCLASSIFIED

AD-A074 870 CONTINUED

Toxicity (U) Soot control, Soot control additives

IDENTIFIERS (U) Metalic fuel additives, Soot emissions, Metal oxides, Metallic fuel additives, PE02001F, WUESLISRC04005, PE02203F, MUFSL360541

SEARCH CONTROL NO 0159028

AD-A074 869 10/2 10/3 10/1

DAYTON UNIV 14110 SCHOOL OF ENGINEERING

(U) Analysis of Remote Site Energy Storage and Generation Systems

DESCRIPTIVE NOTE Final technical rept Jul 78-Jun 79.

JUL '79 148P

PERSONAL AUTHORS CRISP, J N , BISHOP, M S , PINSON, J D , ANDERSON, L A

REPORT NO UDR-1R-79-35, UDSE-TR-79-02

CONTRACT NO F3015-77-C-2004

MONITOR AFSC/ESL

TR 79-20

## UNCLASSIFIED REPORT

ABSTRACT (U) This report presents the results of an investigation and analysis of energy storage systems and alternate energy sources for remote site applications. The first part of the report centers on the cited based study of hydrogen storage, thermal storage, batteries, and flywheels as energy storage systems along with wind turbine solar photovoltaic and solar thermal energy converters. A wind turbine battery system was recommended based on performance, cost and availability. Effort under the second phase of the program concentrated on a system using two separate nominal eight kilowatt wind turbines mounted in conjunction with a lead acid battery energy storage unit. The system was specified to operate in conjunction with an existing power grid system located at Bar Harbor, Barter Island, Alaska. Specific system concepts and recommendations are presented with supporting analyses. A design checklist is included with specific items for consideration in the preparation of a design specification (Author)

DESCRIPTIONS (U) Electric power production, Wind machines, Energy storage, Storage batteries, Remote areas, Turbogenerators, Performance Engineering, Cost analysis, Operational readiness, Experimental design, Comparison, Solar energy, Thermal power plants, Hydrogen, oxygen fuel cells, Thermionic power generation, Photovoltaic effect

AD A074 870

AD-A074 869

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PAGE J15 055028

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ORGANIZATIONAL BEHAVIOR

AO A073 940 11/3 1/2 13/2

TRINITY UNIVERSITY SAN ANTONIO TX 78128-4697 713-286-3300

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## Laboratory Evaluation of a Fixed Film Dutch Reactor Comparing the Performance of Various Spent Fuel Wastes

SCRIPTIVE ROTE Final rept Oct 77 Jan 78

MARCH 1984 VOL 62 / NO 3

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AFREG/ESI

11) ISHT aircraft and ground support equipment receive the protection of 1/16" thick polyvinyl chloride paint. Maintenance of such painted surfaces is a major problem. A vinyl containing stripper has created a disposal problem that is aggravated by the carelessness of some aircraft maintenance crews. The research investigation studied performance of a relatively simple, dedicated function, trickling filter type bio降解化 unit. The specific waste treated was the concentrated phenolic waste water produced by the KODAK AFB AIC dephant facility. Three filter units utilizing a top ocean fluid air flow batch operation were built at the University of San Antonio, TX. Experimental work is continuing to develop a transport module which can be used in the field. The system is simple, reliable, and cost effective. The system is currently being evaluated for use in the field.

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AD-A073 060 11/4 7/7 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TINERL AND FL DETACHMENT 5 (AAC)(U) Reinforced Concrete from Bond Damage Repair of Airfield  
Pavements

DESCRIPTION NOTE Final rpt. Jan 76-Feb 77 on Phase 1.

NOV 77 101P

PERSONAL AUTHORS Smith, Alvin.

REPORT NO CEDO-TR-77-55

CONTRACT NO MIPR-F08832 76-00007

UNCLASSIFIED REPORT

ABSTRACT (U) This study was Phase 1 of a two phase study and was conducted to determine whether commercial liquid resins can be used successfully as binders or matrix materials with aggregates to form a resin concrete for rapidly repairing small damaged areas in airfield runway pavements. One type of liquid resin system, a highly reactive polyester, was shown to have the necessary properties to claim nearest to meeting all of the Phase 1 objectives, including aggregate penetration, polymerization rate, early strength development, ease of application, and cost to meet all of the design objectives. Further studies of the identified material should focus on (1) material improvement in the areas identified as having performance weaknesses (e.g., bonding to wet aggregates), (2) repair batch designs which relate to composite material properties to patch size and substrate support quality, and (3) application equipment criteria and design. However, the sponsor agency recommends that new concepts be investigated rather than continue with further work on this particular resin system. (Author)

52  
DESCRIPTORS (U) •Runways •Pavements •Airports  
•Landing fields •Composite materials •Reinforced  
concrete •Polymer binders •Bond damage repair  
•Experimental design •Bonding •Performance tests •Air  
force facilities

IDENTIFIERS (U) Resin concrete Polymer concrete

AD-A073 560

AD A073 889

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DATA REPORT BIBLIOGRAPHY  
AD A073 479 1/4 13/3  
ARMY ENGINEER MATERIALS EXPERIMENTAL STATION, VICKSBURG, MS  
(U) Evaluation of Materials for Contingency Runways  
DESCRIPTIVE NOTE Final rept Dec 79-Aug 78.  
JUL 79 101P  
PERSONAL AUTHORS Romm, C L, Sullivan, A L, III  
Stoberger, J H  
PROJECT NO 2104  
TASK NO 2B  
MONITOR CEE00  
TR 78-48

SEARCH CONTROL NO 055028  
AD A073 431 9/1 17/4 13/8 18/1  
AIR FORCE ENGINEERING AND SERVICES CENTER, TYNDALL AFB, FL  
ENGINEERING AND SERVICES LAB  
(U) Corrosion Control of Hardened Inter-site Cable System  
(HICCS) Splice Cases  
EVALUATIVE NOTE Final rept Nov 75-Vol 78.  
MAY '78 40P  
PERSONAL AUTHORS Lewicki, Thomas F  
PROJECT NO AFEC/ESL-TR-79-17  
PROJECT NO 2094  
TASK NO 4C

UNCLASSIFIED REPORT

ABSTRACT (U) A literature review was conducted to determine soil and rock types in various European and Middle Eastern countries, and the results are shown in Appendix A of this report. A study was conducted to evaluate the performance of selected materials when used for constructing contingency type runways for fighter bombers. A test section consisting of four items was constructed on a prepared loam clay subgrade with a rated CBR of 10 with thickness of base courses over the subgrade determined from present criteria and a rock surface over all items.

DISCUSSION (U) Runways, Construction Materials, Rock Mechanics, Soil Tests, Repair, Vulnerability, Test and Evaluation, Maintenance, Contact Support  
IDENTIFERS (U) F 4C AFRC/MA, AF-63723P, WOICED0010432825 (PN CEE00-77-016  
WICED0010432825

ABSTRACT (U) Several thousand splice cases are in use on the hardened inter-site cable system between the Strategic Air Command's Minuteman sites. These splice cases are exposed to severe galvanic corrosion caused by interconnection with the graphite insulators, polyethylene cable sheath which acts as a large cathode. The Air Force Civil Engineering Center conducted laboratory and field tests to determine the magnitude of corrosion on three different splice cases in use and to develop the revised criteria for potential criteria to achieve adequate cathodic protection (CP). Test results showed that aluminum splice cases will galvanically deteriorate, and that bronze splice cases with bronze connecting hardware experience little corrosion. The interconnection of dissimilar metals (graphite and splice case) resulted in the surface potential criteria being significantly different from the standard CP criteria of either a - .85 volt surface potential or a negative 300 millivolt shift. The revised criteria for an aluminum splice case called for a surface potential of - .55 volt or a negative 400 millivolt shift whereas the cast iron splice case required a surface potential of - .35 volt or a negative 510 millivolt shift. The revised surface potential criteria and the procedure developed to determine the diagnosis of corrosion with dissimilar metals (Author) metallic system with dissimilar metals (Author)

DISCUSSION (U) • Electric cables, • Splices • Packaging

AD A073 479

AD A073 431  
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## UNCLASSIFIED

AD-A072 349 17/2 1  
 AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALE AFB FL  
 ENGINEERING AND SERVICES LAB

(U) Individual Fire Fighter Communications

DESCRIPTIVE NOTE Final rept Oct 78 Jul 78.

MAR 78 46P PERSONAL AUTHORS Knowles, Norman D.

REPORT NO AFSC/ESL TR-78-04

PROJECT NO A14N

TASK NO 30 UNCLASSIFIED REPORT

DISC REPORT BIBLIOGRAPHY

SEARCH: CONTROL NO 055028

AD A071 002 14/2 13/2 14/5

WASHINGTON UNIV SEATTLE REMOTE SENSING APPLICATIONS LAB

(U) Study in Remote Sensing for Land Use

DESCRIPTIVE NOTE Final rept Apr 77-Jan 78.

JUN 79 74P PERSONAL AUTHORS Shinn, Richard O; Nestorik, Ed; Frank, V.

CONTRACT NO F08035-77-C-0278

PROJECT NO 2103

TASK NO 9P

MONITOR AFSC/ESL

TP-79-05

ABSTRACT (U) The Engineering and Services Laboratory (ESL) conducted an evaluation to fulfill an operational requirement for an individual, two-way communications system for fire fighters. Contracts were initiated on April 1977 to obtain the basic radio and as a result of this procurement, nation integrated systems were bought and tested. The acquisition included a new type hood, helmet, and breathing system. This new hardware was tested because it appeared to offer the greatest potential for satisfying the stated needs of the operational fire protection unit within the United States Air Force. The primary objective of this equipment evaluation was to provide a procurement description (specification) of the requirements so that authorization documentation could be developed or revised.

DESCRIPTION (U) Effect equipment, Communication and Radio Systems, Respiratory equipment, Air Force equipment, Fire Fighting Equipment, Emergency Equipment, Safety equipment

IDENTIFIERS (U) AFSC/ESL TR-78-04, PEB774F

## UNCLASSIFIED REPORT

ABSTRACT (U) This research tested three methods of obtaining land use information by remote sensing for United States Air Force (USA) land use planning. The three methods tested were (1) photo interpretation of aircraft photography, (2) automated (computer processing of binary) or linguistic imagery, and (3) statistical analysis of Landsat digital data. The two sites tested were MacDill AFB and Fairchild AFB in Washington State. Using test scenarios of mission realignments in Washington State, photo interpretation was found to be accurate and ready means to obtain land use information. (Author)

DESCRIPTION (U) Remote sensors, Land use, Urban planning, Photo interpretation, Image processing, Cathode ray tube, Air force planning, Aerial photography, Land areas, Optical equipment

IDENTIFIERS (U) AFSC/ESL TR-79-05, AFSC/ESL TR-79-05

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DTIC REPRODUCED BY MICROFILM  
SEARCH CONTROL NO 052078  
AD A073 222 13/2 6/20 12/1 0/0  
20/4  
TITLE (U) REVIEW OF TOXIC SPILL MODELING  
SUBJECTS (U) Review of Toxic Spill Modeling  
DESCRIPTIVE NOTE Final report 1 Feb-1 Dec 77  
NOV 18 2009  
PERSONAL AUTHOR(S) Benedict, Barry A.  
CONTRACT NO F08635 77-C-0237  
PROJECT NO 1900  
TASK NO SW  
MONITOR CEDU  
TR-76-90

UNCLASSIFIED REPORT

1AC DOCUMENT TYPE MCIC - HARD COPY --

1AC SUBJECT TERMS M (U)Country USA, CORROSION, Galvanic Corrosion, Carbon Coates, Graphite, Activated Polychloro Coatings, Polymeric Coatings, Future, Cast Iron, Bronze, Copper Alloys, Dissimilar Joining, Electro-Protective, Nickel Coatings, Alloyed Alumina, Field Testings

1AC NO MCIC 126710

ABSTRACT (U) This study is a literature survey which identifies existing mathematical models available for the description of toxic spills into waterways. Advantages and disadvantages of numerous models are discussed. Emphasis is placed on model coefficients because these are very difficult to define. Guidelines are presented for coefficient selection. This selection must consider such parameters as river bends, varying channel geometries, stratified flows and oscillating flows (the interactions of convective transport, turbulent mixing, chemical reactions and other processes are reviewed). Guidelines are also given for matching the best mathematical model to particular toxic spill scenarios. Modeling techniques are discussed to fully describe toxic spills. This literature review provides a useful planning tool for future model development (Author)

DESCRIPTORS (U) \*Water pollution, Mathematical models, \*Toxic agents, Spilling, Water quality, Waterways, Rivers, Lakes, Estuaries, Channels, Waterways, Diffusion, Dissers, Po, Coefficients, Fluid flow, Transport properties, mixing, Chemical reactions, Literature surveys, Damage assessment  
IDENTIFIERS (U) \*Toxic Spills, 052078  
WU76D12005M28  
AD A073 222

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PAGE 349 052078

F2 A073 431

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OTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A070 940 1/5 9/2

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DEPARTMENT I (ADTC)

(U) A Literature Search and Review of the Dynamics of  
Aircraft Surface Interaction

DESCRIPTIVE NOTE: Final rept : Oct 77-31 May 78.

JUN 19 78P

REF ID: A27475

REPORT DATE: 26 May 78

REPORT NUMBER: CEE00-1R-78-39

PROJECT NO: 2104

TECHNICAL ACTIVITIES: Landing, P : Procurement

TELETYPE: 355-870 30483

CONTRACT NO: F00325-78-C 0025

PROJECT : 2054

TASK ID: 50

INSTITUTION: AFSC/ESL

TR-78 05

UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT (U) The purpose of this study was to investigate the feasibility of using tracer gas technology to locate leaks in underground RIC-WIL steel pipe ratings. A series of controlled model experiments at the contractor's plant demonstrated that one or more leaks in a buried steel pipe could be detected by surface measurement of tracer gas concentration. A full-scale demonstration test was conducted at Naval Air Station North Island on a 400 foot casting with suspended banks. Two leaks were localized to within three feet using the hardware and procedure developed during the controlled experiments. Simplification would be required before the tracer gas technique could be used on a routine service basis at Air Force bases (Author)

IDENTIFIERS: (U) 1) leak detection, tracer studies, Steam pipes, Trace gases, Gas chromatography, Corrosion, Sulfur compounds, Flue gases, Halogenated hydrocarbons  
(U) P-674708F WUCCE0026545012

DESCRIPTIONS: (U) 1) Surface roughness, Aircraft, Landing, Computerized simulation, Fatigue (Mechanics), Human factors engineering, Track of analyses, Roll, Yaw, and lateral degrees of freedom literature surveys

AD-A070 941

AD-A070 940

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## UNCLASSIFIED

AD 5070 728	13/7	DTIC REPORT NUMBER	59 ARCH CONTROL NO	050578
ILLINOIS STATE WATER SURVEY	URBANA		AD 5070 480	10/4
(U) Industrial Water Treatment Technology Transfer Techniques and Management		SCIENTIFIC APPLICATIONS INC FOR WALTON BEACH FL		13/12
OF CRITICAL FACILITY		(U) RAC/IS Descriptor Application Methodology		14/2
FEB 79 42P		SCRIPTURE MURK	final rept	Rec 78 1 Mar 79
PERSONAL AUTHORS		WAY 79	44P	
LUDV RUSSELL		PERSONAL AUTHORS	Hybrid, Delta, R	
(CONTACT NO: FA1068 77 5 0029		CONTRACT NO:	FOR 637 78 4-0114	
PROJECT NO: 1054		PROJECT NO:	2103	
17-4 NO 50		TASK NO:	PF	
MANFOR CEF X0		MONITOR	AES/ST	
TR 19 01			TR 78 02	

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

**ABSTRACT** (U) To develop technology, delivery methods, and rays of the water handling facility at Chanute AFB and Scott AFB, we conducted with the purpose of recognizing water caused problems and presenting means of reducing these problems, particularly corrosion recommendations purchase and installation of necessary water heating and water testing equipment were provided. Water treating chemicals were also purchased for application to remove scale and corrosion. Base personnel were transferred in water treatment testing and control with the resulting water caused problems. In both return contractors cooling towers and portable water systems were significantly reduced at Chanute AFB. At Scott AFB, the equipment was installed and chemicals supplied. However, application of the results were incomplete because equipment was installed as of late date consideration was given to the problems involved setting for effective water treatment programs at other Air Force bases.

**DESCRIPTION** (U) Water treatment Corrosion inhibition Test methods Air Force facilities filters, cooling towers, cooling water, boilers, high temperature scale Corrosion resistance transfer equipment 10(UNITS) (U) VHS 10205411 1047565  
AD 5070 480

**ABSTRACT** (U) This report was prepared to provide range commanders and range planners with a readily applied methodology for addressing land use planning and land use conflicts problems arising from the use of various ordnance types on US Air Force tactical training and flight test ranges. The methodology described presents a means for using the products developed under the Range Compatibility Use Zone (RCUZ) program. This methodology consists of a step by step procedure for surveying "step" safety areas descriptors developed under a previous contract to a spectrum of range training operations and training problems. The range safety area descriptors discussed are contours about the target oriented with respect to the direction of weapon delivery against the specific target with specific military tactics. The report has been designed to make usable the currently existing area descriptors when used as a transparent plastic overlay as traced on clear plastic to provide a framework for placing at the disposal of the users any future descriptors as they are developed and any modifications to the range safety area.

**DESCRIPTION** (U) Range safety training test(ishance) Air to surface Air Force planning, tactical, air to ground, delivery, aircraft maneuver, impact, ricochet, nose, fore, rear, horizontal, vertical, rounds, training, demilitarization, terminal ballistic, simulation, target.

AD 5070 480  
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AD AGTG 273 CONTINUED

Sludge sample. Solvent extraction chain be used to separateively extract individual metals from a sludge but; the process was not economical. (Author)

DESCR: PT/AS (U) characterizing, waste water, metals, precipitation, Recovery, Metal complex, Hyd. ox, 302, water, treatment, cloudy, slurries, extraction, pH factor, water, treatment, water pollution

INVENTORS (U) RUEVTRU, RUEVTRU, RUEVTRU

DTIC REPORT PHOTOGRAPH

SEARCH CONTROL NO 0255026

AD AGTG 273 8/17 11/4

NAVY CLOTHING AND TEXTILE RESEARCH FACILITY NAUTICK MA

(U) Alimatized Firemen's (fire proximity) Handwear

Redesign of Experimental Prototype

DISCRETE NOTE Final rept Oct 76-Sep 77.

DEC 78 11P

PERSONAL AUTHORIS. Archivs. Francis S

REPORT NO NCTR 136

PROJECT NO 414N

TASK NO 30

MONITOR CEDDO

TR 78-06

UNCLASSIFIED REPORT

ABSTRACT (U) The Navy Clothing and Textile Research Facility (NCTR) continued development work to improve a new experimental configuration of aluminized fire proximity handwear having increased dexterity and manipulatory capabilities. An improved prototype was completed and additional quantities of this model are being manufactured for further testing and establishment of thermal protection parameters. Performance of tests is recommended with a view towards completing the program and possible adoption of this new configuration as a replacement for current standard fire proximity handwear

DESCRIPTORS (U) \*Gloves, protective clothing, fire resistant materials, thermal insulation, fire fighting, Human factors engineering, Aluminum, Asbestos, Polyamide, Plastics, Composite materials

INVENTORS (U) IPN-AFEC-77 002, NUCLEDO 14N300U  
FLY4734F

AD AGTG 273

AD AGTG 895

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PAGE 244 055026

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DTIC REPORT BIBLIOGRAPHY		SEARCH CONTROL NO 053082		DATE 5					
AD-AC69 48A	21/2 1	13/2	AD-AC94 48B	13/2	1/5				
CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE TYNDALL AFB FL DEPARTMENT I (ADTC)			NEW MEXICO UNIV ALBUQUERQUE FRIC: H WANG'S CIVIL ENGINEERING RESEARCH FACILITY		11/4				
(u) Hydrazine Disposal by Burning			(u) An Evaluation of asphalt-polymer mixtures for use in Pavement Systems						
DESCRIPTIVE NOTE	Interim rept	Sep 78-Oct 78.	DESCRIPTIVE NOTE	Final rept	Apr 77-Feb 79.				
PERSONAL AUTHORS	SCHEFFER, THOMAS A.	FRANKLIN, MELVIN D.	PERSONAL AUTHORS	DECKER, DR. LE S.	BRITTON, DONALD F.				
REPORT NO	CELD0-TR-78-55		REPORT NO	DR-25001-78-5-0045					
PROJECT NO	19000		PROJECT NO	2104					
TASK NO	4C		TASK NO	1A					
UNCLASSIFIED REPORT		MONTH/YR	CELE0	TR-78-02	UNCLASSIFIED REPORT				
ABSTRACT		<p>(u) Burning was evaluated as a technique for the disposal of hydrazine and aromatic hydrazine solutions. Samples were collected above the burning pool and analyzed for hydrazine concentration to determine if concentrations exceeded the permissible exposure threshold (1 mg/m<sup>3</sup>) in the vicinity of the burning site. The fuel burns rapidly leaving little residual hydrazine, but ignition of aqueous solutions becomes progressively more difficult as the water concentration increases. Some 5000 samples collected above the burning hydrazine solutions exceed NIOSH personnel exposure limits. However, high destruction efficiency, rapid destruction, and potential cost savings make burning an attractive alternative to chemical neutralization under controlled conditions as discussed in this report (author).</p>							
DISCUSSION		<p>(u) Hydrazine disposal techniques, solutions (mixtures), toxicity, liquid rocket propellants, combustion, air pollution, safety, low cost.</p>							
IDENTIFIERS		<p>(u) Interim, WUCF0019004C1, WEC101</p>							
AD-A089 446									
DATE 5									

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MAY 1974

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DTIC REPORT BIBLIOGRAPHY

SFARCA CONTROL NO: 05C0218

AD-A089 173 13/2 21/9 1

13/4  
AD-A089 280 20/4 CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TINDAI: AFM CL DETACHMENT 1 (ADTC)  
(U) JP-4 Fuel Storage Emissions

DESCRIPTIVE NOTE Final rept Sep 77-Dec 78.

DEC 78 32P

PERSONAL AUTHORS Stauffer, Thomas B.

REPORT NO CEDO-TR-78-05

PROJECT NO 2103

TASK NO 2C

UNCLASSIFIED REPORT

DESCRIPTIVE NOTE Final rept Jan 79-Jan 79.

APR 79 TOP

PERSONAL AUTHORS Stone, Daniel A.

REPORT NO AFES-78-TR-79-10

PROJECT NO 1900

TASK NO 2D

UNCLASSIFIED REPORT

ABSTRACT (U) JP-4 vapors from underground fixed roof storage tanks were analyzed for hydrocarbon concentration by Gas Chromatography using a Flame Ionization Detector. Results are compared with predictions based on American Petroleum Institute correlations. Since Air Force tanks periodically refilled within 24 hours of emptying, only turnover times of 24 hours and less were considered. It was found that, within 14 hours tank air reached only 7.8 percent of saturation for JP-4. At turnover times of 7.5 hours and less a marked laying off of vapor concentration could be measured in the displaced air. At 15 turnover times less than predicted by equations because of the rapid turnover and consequent reduction in vapor concentration. Data presented provide a basis for calculating a rough estimate for hydrocarbon mass emitted from fuel storage tanks. Actual mass emissions measured during the study, varying from 0.0 to 15 lb/1000 gal of JP-4 transferred, while the fuel temperature ranged from 51 F to 79 F. (Author)

KEYWORDS (U) \*Jet engine fuels, \*Storage tanks, \*Underground facilities, Vapors, Hydrocarbons, Gas chromatography, Flames, Concentration(Chemistry), Gas chromatography, Flames, Ionized gasses, Detectors, Air pollution, Environmental factors, Mathematical prediction, Data acquisition

IDENTIFIERS (U) JP-4 fuel, NCEED02103C10 PEG28011

AD-A089 28C

AD-A089 173

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## DTIC REPORT BIBLIOGRAPHY

AD-A089 045 13 '11 11/6 16/7  
HARCO CORP MEDINA OH  
(U) Techniques for Cathodic Protection Testing over  
Airfield Pavements

SPR '79 71P  
DESCRIPTIVE NOTE: Final rept. - , 77-Jul 78 on Phase 1.

PERSONAL AUTHORS: Hassock, Bernard .

CONTRACT NO 100638-77-C-0248

PROJECT NO 2104

TASK NO EC

MONITOR: GEEDO  
TR-78-31

## UNCLASSIFIED REPORT

ABSTRACT. (U) This report summarizes the techniques developed for cathodic protection testing over airfield pavements. Test results conclusively proved that the accuracy of all fibre-to-surface potential measurements taken over pavement surfaces are questionable. On concrete pavement, it was found that potential readings differed from readings on adjacent soil by more than 100 millivolts. Potential readings over well sealed asphalt surfaces were not possible even when using high input impedance, electronic voltmeters. Potential readings over deteriorated asphalt were possible but the accuracy was poor. Accurate potential measurements over pavement surfaces can be made only if the reference electrode contacts the surface beneath the pavement. This report recommends a procedure for easily penetrating the pavement surface and installing a pavement tester through which a modified reference electrode may be inserted (Author)

DESCRIPTORS (U) Pipelines. Cathodic protection. Test methods. Corrosion inhibition. Corrosion. Runways. Pavements. Landing fields. Soils. Voltage. Measurement. Electrodes. Underground. Copper compounds. Sulfates

IDENTIFIERS (U) PEE03723F. WUCED02104F20

AD-A089 045

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## DTIC REPORT BIBLIOGRAPHY

SEAL'D CONTROL NO 059026  
AD-A088 991 20/4 13/4 13/2  
AIR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL  
ENGINEERING AND SERVICES LAB

(U) Control of JP-4 Emissions from Underground Storage  
Tanks

DESCRIPTIVE NOTE: Interim rept. Jun-Sep 78.

APR '79 21P

PERSONAL AUTHORS: Lewandowski, Gordon A ; Stauffer, Thomas B

REPORT NO AFFSC/ESL-TR-78-03

## UNCLASSIFIED REPORT

ABSTRACT: (U) The South Coast Air Quality Management District, in southern California, is presently requiring controls on underground JP-4 tanks at March, Norton, and George AFB. It is expected that such controls may eventually be required at other Air Force installations. Therefore, an engineering study was undertaken to (1) review the problem for Southern California and make recommendations there appropriate, and (2) determine the extent of the problem for the USAF as a whole. This report covers the first of these objectives. After visiting the above mentioned Air Force bases, and compiling an engineering assessment of potential control strategies, low temperature refigeration and recovery of condensed JP-4 vapors is recommended as the best control method. (Author)

DESCRIPTORS (U) Jet engine fuels. Storage tanks. Underground facilities. Air pollution. Protection. Emissions control. Vapors. Environment. Air Force facilities. California. Materials recovery. Refrigeration systems. Incinerators. Absorption of JP-4 fuel. PEE0201F. WUCED18007002

IDENTIFIERS (U)

PEE03723F. WUCED02104F20

PAGE 376 055028

## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

AD-A088 617 10/4 13/2 AYR FORCE ENGINEERING AND SERVICES CENTER TYNDALL AFB FL ENGINEERING AND SERVICES LAB

(U) Interim field procedure for bomb damage repair (using crushed limestone for crater repairs and Sikkal (Trade Name) for "spall" Repairs).

DESCRIPTIVE NOTE: Interim rept Jun 78-Mar 79.

APR 79 61P

PERSONAL AUTHORS: McNamee, Michael T. ,

REPORT NO. AFESC/ESI-TR-79-01

PROJECT NO. 2104

TASK NO. 2B

PERSONAL AUTHORS: Battley, Milton ;  
REPORT NO. MCTR-137  
PROJECT NO. 414N  
TASK NO. 30  
MONITOR CEDDO  
TR-78-07

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes a recommended procedure for performing repairs in large and small bomb craters using crushed stone as the repair material. The report also describes a rapid spall repair technique using a proprietary polymer concrete product. The repair techniques are described to determine the equipment manpower, and time required to effect repairs. The report gives a brief description of the results of field tests using the crushed stone and polymer concrete techniques (Author)

DECORATORS: (U) \*Bomb damage, \*Repairs, \*Runways, \*Repair, Maintenance, Field conditions, Civil engineering, Craters, Explosion effects, Limestone, Spallation

IDENTIFIERS: (U) \*Runway Repairs, Polymer-Concrete, Sikkal, WA/ESC/21042B22, PEG3723F

SEARCH CONTROL NO. 055028  
AD-A088 264 8/17 6/7  
NAVY CLOTHING AND TEXTILE RESEARCH FACILITY Natick Mass  
(U) Insulated Firefighters' Crash-Crew Rescue Boots and Components Field and Laboratory Evaluation  
DESCRIPTIVE NOTE: Final rept Oct 78-Sep 77.  
DEC 78 44P  
PERSONAL AUTHORS: Battley, Milton ;  
REPORT NO. MCTR-137  
PROJECT NO. 414N  
TASK NO. 30  
MONITOR CEDDO  
TR-78-07

## UNCLASSIFIED REPORT

ABSTRACT: (U) The Navy Clothing and Textile Research Facility (NCTR) conducted an evaluation of commercial insulated firefighters' boots worn by crash firefighters representing three Navy Air Stations and three Air Force Bases. The evaluation revealed that the insulated firefighter boot was significantly superior to the standard firefighter boot currently in the supply system. Reflective spats, occasionless fasteners used to cover boots for additional protection against high heat, were considered unnecessary by the subjects who thought the insulation of the test boots provided sufficient protection. Laboratory findings, however, showed that spats would indeed be needed if personnel became immobilized and were subjected to 1.89 SCAL/sq cm/sec heat for 30 seconds or longer. The laboratory tests also showed that the heat rapidly penetrates and destroys soiled aluminum fabrics. Based on these findings NCTR recommends: (1) insulated firefighters' boots replace standard firefighters' boots; (2) commercial aluminum spats be stocked as supporting gear; and (3) reflectivity of aluminum fabrics generally, and of spats particularly, be polished and maintained daily to assure peak personnel protection at all times (Author)

DESCRIPTORS (U) \*Boots, \*Rescue equipment, Fire fighting, Crews, Heat transfer, Naval equipment, Crashes  
AD-A088 264

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AD-A088 617

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AD-A088 264 CONTINUED

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A087 282 13/2 21/2 1/3

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADTC)

(U) Aircraft Air Pollution Emission Estimation Techniques -  
ACEE

DESCRIPTIVE NOTE. Final rept. Aug 77-Aug 78.

SEP 78 107P

PERSONAL AUTHORS Scott, Harold A. Jr., Naugle, Dennis F.

REPORT NO CECDO-TR 78-33

PROJECT NO 2103

TASK NO 5A

UNCLASSIFIED REPORT

Availability Document partially illegible

ABSTRACT. (U) A five-step analytical methodology is presented that can be adapted to nearly any aircraft related air quality assessment problem. The methodology is for use by base level environmental personnel to calculate: (1) annual aircraft emissions, and (2) downfield pollution concentrations. The latest individual engine emission factors and other information required for the methodology are contained in this report (Author)

DESCRIPTORS (U) \*Air Pollution, Aircraft exhaust, \*Exhaust gases, Aircraft, Air quality, Smoke, Jet engine exhaust, Contaminants, Environmental protection, Measurement, Test methods, Hydrocarbons, Carbon monoxide, Emission

IDENTIFIERS (U) \*Aircraft Air Pollution,  
MUCECO21035A28, PEG3723F

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AD-A087 282

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AD-A088 152 13/2 1/5 7/4 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
 CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
 TYNDALL AFB FL DETACHMENT 1 (ADTC)  
 (U) Removal of Trichloroethylene Contamination from  
 Drinking Water at a USAF Installation

DESCRIPTIVE NOTE: Interim rept. 1 Aug 77-31 Jul 78.  
 JUL 78 19P PERSONAL AUTHORS: Perry, Robert A :  
 REPORT NO: CEEFO-TR-78-48

UNCLASSIFIED REPORT

ABSTRACT. (U) Trichloroethylene (TCE), a solvent previously used by numerous USAF industrial activities as a degrading agent, was discovered in relatively high concentrations in the drinking water distribution system at one USAF installation. Various USAF agencies and the U.S. Environmental Protection Agency cooperated in research work to determine the most economically feasible method to remove TCE from the water supply. This report documents the historical aspects of the problem and the results of this phase of the research (author).

DESCRIPTORS: (U) Water treatment, Drinking water, Air force facilities, Trichloroethylene, Contaminants, Water pollution, Health, Environmental protection, Removal, Water supplies, Purification

AD-A088 804 1/5 13/2 CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE TYNDALL AFB FL DETACHMENT 1 (ADTC)  
 (U) Laboratory Evaluation of Expedient Pavement Repair Materials

DESCRIPTIVE NOTE: Final rept. Jan 78-Jun 78.  
 JUN 78 83P PERSONAL AUTHORS: Rollings, Raymond S :  
 REPORT NO: CEEFO-TR-78-44

PROJECT NO. 2104 TASK NO. 2B

## UNCLASSIFIED REPORT

ABSTRACT: (U) Past work and current technical literature were reviewed to determine potential capping materials for expedient repair of small craters (less than 20 by 20 feet repair areas) in airfield pavements. Seven materials identified in the literature review were tested in the laboratory to develop information on their strength and cure requirements. Accelerated high elevated cement, magnesium phosphate cement, three commercial asphaltic products and unsurfaced, well compacted aggregate were recommended for field testing. (author)

DESCRIPTIONS: (U) Landing fields, Civil engineering, Pavements, repair, Literature surveys, Bonding, Damage assessment, Cratering, Concrete, Asphalt, Laboratory tests, Curing, Reinforced concrete, Aluminum, Magnesium compounds, Phosphates

IDENTIFIERS. (U) HUCCFD02 1042B22, PEB83723F  
 AD-A088 804  
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## DTIC REPORT BIBLIOGRAPHY

AD-A080 544	8/17	5/9	SEARCH CONTROL NO. 058028
NAVY CLOTHING AND TEXTILE RESEARCH FACILITY MATICK MASS			AD-A080 510 1/5 13/2 15/5
(U) Field Evaluation of Experimental Crash-Crew			CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE
Firstfighter's® Fabrication			TYNDALL AFB FL DETACHMENT 1 (ADTC)
DESCRITIVE NOTE Final rept Oct 78-Sep 77.			(U) Evaluation of Materials for Post-Attack Pavement
DEC 78 47P			Repair
PERSONAL. AUTHORS: Austin, Norman F			DESCRITIVE NOTE Final rept Sep 78-Dec 77.
REPORT NO. NCTR-133			SEP 78 108P
PROJECT NO. 414N			PERSONAL AUTHORS Bone, C. L., Sullivan, A. L., III.
TASK NO. 30			REPORT NO. CEDDO-TR-78-18
MONITOR: CEDDO			PROJECT NO. 2104
TR-78-05			TASK NO. 28

## UNCLASSIFIED REPORT

**ABSTRACT.** (U) The Navy Clothing and Textile Research Facility (NCTR) under the sponsorship of the Civil and Environmental Engineering Development Office (CEDDO), Detachment 1 ADTC, Tyndall Air Force Base, conducted a field evaluation of an Abciter-over-coated experimental crash-crew "lighter's" gold® acceptable to determine if the experimental fabric was more durable than the standard type. Laboratory results had previously shown the experimental fabric to have at least 10 times better abrasion resistance than the standard (author)

**DISCLOSURES.** (U) Speculates, "Guard Crews, \*fire Fighting, Fire protective clothing, Naval personnel, Crashes, Rescue equipment, Abrasion, fire resistant, Coatings, Gold, Laboratory tests, Field tests, Infrared radiation, Heat resistant materials, Heat transmission IDENTIFIERS: (U) LPN-ARFCEC-PD-77-02, MUCEDDO414N006, PEB474F

## UNCLASSIFIED REPORT

**ABSTRACT.** (U) This study was conducted to evaluate the performance of candidate materials used to repair small damaged areas in pavement when subjected to traffic by an F4C aircraft loading. The study consisted of preparing simulated damaged areas in portland cement concrete pavement and flexible pavement and repairing the areas with selected materials. The evaluation was based on the performance of the repaired areas when subjected to accelerated traffic with a loading equivalent to one main gear of the F4C aircraft (Author)

**DISCLOSURES.** (U) Landing fields, \*Pavements, \*Repair, Maintenance, Fighter aircraft, Damage assessment, Cements, Reinforced concrete, Air traffic, Loads(Forces), Epoxy resins, Asphalt, Polyester fibers, Limestone, Postattack operations

**IDENTIFIERS:** (U) F-4C aircraft, LPN CEDDO-77-81, MUCEDDO21042823, PEB3723F

## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

AD-A088 482

6/17

SEARCH CONTROL NO 055028

AD-A088 492 CONTINUED

NAVY CLOTHING AND TEXTILE RESEARCH FACILITY Natick Mass

(U) Authorized Firefighters' Crash-Rescue Protective Hood

Facepiece-Visor Redesign Study

DESCRIPTIVE NOTE: Final rept Oct 76-Sep 77,

DEC 78 16P

PERSONAL AUTHORS: Andrik, Francis S

REPORT NO. NCTR-F-134

CONTRACT NO. AFCEC-77-002

PROJECT NO. 414N

TASK NO. 30

MONITOR: CEDDO

TR-78-04

## UNCLASSIFIED REPORT

**ABSTRACT:** (U) The Navy Clothing and Textile Research Facility (NCTR) conducted a redesign study for the purpose of improving the standard aluminum hood directed towards developing an adjustable facepiece visor assembly, which would permit unrestricted visibility, verbal communication, and the exchange of fresh air during standby situations. An adjustable configuration was conceived and initial samples of a comparable commercial type were fabricated and subjected to a limited performance test. Results showed this type to be highly functional; however, under fire emergency conditions, several areas proved to be marginal or inadequate. To eliminate these problem areas, NCTR modified the facepiece design. As the required task approached completion, the fiscal year ended and the program terminated, because the need still exists for an improved hood, appropriation of additional funds and continuation of this redesign study is recommended.

**DESCRIPTORS:** (U) \*Fire protective clothing, Hoods, Visors, Protective coverings, Fire resistant materials, Aluminum, Test methods, Performance tests, Naval research, Crash test

AD-A088 492

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IDENTIFIERS (U) PL04714F, WUCEDD014N0006  
TAC NO. PL-032338

IAC DOCUMENT TYPE: PLASTC - HARD COPY --

IAC SUBJECT TERMS: P--(U)Design optimization, Protective clothing, Textiles, Facepieces, Flame retardants, Aluminum, Military applications, Prototypes, Visors, Test methods, 72 Unl limited.

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AD-A085 829 13/2 7/3  
 CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
 THMOA1, AFB FL DETACHMENT 1 (ADTC)  
 (U) The Ozone Oxidation of Hydrazine Fuels  
 DESCRIPTIVE NOTE Final rept Jun-Sep 78.  
 SEP 78 117P  
 PERSONAL AUTHORS Sierka, Raymond A., Cowen, William F.  
 REPORT NO CEE00-TR-78-43  
 PROJECT NO. 2103  
 TASK NO. 74

## UNCLASSIFIED REPORT

599

ABSTRACT: (U) This research centered on the treatment of aqueous solutions of hydrazine (H), monoethylhydrazine (MEH), and unsymmetrical dimethylhydrazine (UDMEH) by ozone. A parametric study was conducted to evaluate the effect of solution concentration and pH, the two catalysts ultraviolet (UV) light and ultrasonics, reactor inlet ozone gas phase concentration and superficial gas velocity. The objectives of this research were (1) to establish the stoichiometry and kinetics of the ozone oxidation of H, MEH, and UDMEH in aqueous solution; (2) to identify the partial oxidation products from the ozone oxidation of hydrazine fuels; (3) to accomplish toxicity testing of the ozone treated wastewaters with fathead minnows and Daphnia magna.

DESCRIPTIONS: (U) \*Waste water, \*ozone treatment, \*hydrazine, \*ozone, Solutions(Mixtures), Water soluble materials, Hydrazine derivatives, Concentration(Chemistry), pH factor, Catalysts, Ultraviolet radiation, Ultrasonic radiation, Oxidation, Stochiometry, Oxidation reduction reactions, Fishes, Bioassay

IDENTIFIERS: (U) PE03723F, WUCED021037W86

## SEARCH CONTROL NO 050028

AD-A085 875 9/2

MARYLAND UNIV COLLEGE PARK COMPUTER SCIENCE CENTER  
 (U) Some Properties of Bottom-Up Cellular Pyramids

DESCRIPTIVE NOTE: Technical rept.  
 FEB 78 10P

PERSONAL AUTHORS Dyer, Charles R., Nakamura, Akira.

REPORT NO TR-731

CONTRACT NO AFOSR-77-3271A

MONITOR AFOSR

TR-79-0209

## UNCLASSIFIED REPORT

ABSTRACT: (U) The formal language recognition capabilities of bottom-up pyramid cellular acceptors are examined. The main result establishes that deterministic bottom-up pyramid acceptors are weaker than deterministic bounded cellular array acceptors. In both one and two dimensions (Author)

DESCRIPTORS: (U) \*Automata, \*Pattern recognition, Image processing, Mapping(Transformations)

IDENTIFIERS: (U) Cellular automata

AD-A085 828

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## DTIC REPORT BIBLIOGRAPHY

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 AD-A083 789 21/2 21/5  
 SCOTT ENVIRONMENTAL TECHNOLOGY INC PLUMSTADVILLE PA  
 (U) F-100 Turbine Engine Afterburner Emission Tests  
 DESCRIPTIVE NOTE. Final rep. Nov 78-Dec 77.  
 (U) Transportable Wastewater Advanced Refinement and  
 Decontamination System.  
 DESCRIPTIVE NOTE. Final technical rep. 11 Nov 77-15 May  
 78.  
 PERSONAL AUTHORS: Williams, Ned D ; Matthews, James ; Party,  
 Robert G ;  
 CONTRACT NO. F22601-78-C-0015  
 PROJECT NO. 2103  
 TASK NO. 2A  
 MONITOR: CEEDO  
 TR-78-54  
 UNCLASSIFIED REPORT

\$60

ABSTRACT. (U) This report documents the design of the  
 Transportable Wastewater Advanced Refinement and  
 Decontamination System (TWARDS). The unit features advanced  
 concepts in wastewater treatment such as induced laminar  
 flow, fixed position sludge collection, fluidized bed and  
 biotic denitrification, and automated instrumentation. A  
 recommended development plan is included with the report  
 which outlines the fabrication schedules and cost  
 estimates for all phases of the project. (author)

DESCRIPTORS. (U) Transportable, Waste water, Water  
 treatment, Data processing, Cost analysis  
 IDENTIFIERS. (U) PEB3723F, WUCED021037U85

ABSTRACT: (U) The afterburner exhaust emissions from  
 three F-100-P-100 engines were measured. Emission rates  
 of hydrocarbons, carbon monoxide and oxides of nitrogen  
 were calculated. Smoke numbers were also measured  
 (Author)

DESCRIPTORS. (U) \*Exhaust gases, \*Afterburners, \*Gas  
 turbines, Air pollution, Particulates, Carbon monoxide,  
 Nitrogen oxides, Measuring instruments, Data acquisition,  
 Test methods, Sampling, Jet fighters  
 IDENTIFIERS. (U) F-15 Aircraft, F-16 Aircraft, PEB3723F,  
 WUCED021032A8

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AD-A082 902	8/5	7/4	9/1
AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA			
(U) Premature Failure of Deep Well Anodes			
DESCRIPTIVE NOTE Final rept Dec 78-May 78.			
URN 78	48P		
PERSONAL AUTHORS	Lawicki, Thomas F.		
PROJECT NO	2102		
TASK NO.	40		
MONITOR:	CEEDO		
	TR-78-40		

UNCLASSIFIED REPORT  
 UNCLASSIFIED REPORT

601

ABSTRACT. (U) This report covers an investigation into the causes of premature failure of deep well anode beds. Anodes or lead wires were retrieved from two failed deep well anode beds and analyzed. Deep well conditions were simulated in the laboratory and graphite and HSC anodes were subjected to different electrolytes and normal current densities. A new wire insulation was tested and compared to HSC wire insulation under deep well conditions in the lab. (Author)

DESCRIPTORS. (U) Corrosion inhibition, Water wells, Lead wires, Simulation, Failure, Hydrostatic pressure, Electrolytes, Gas generating systems, Gas analysis  
 IDENTIFIERS. (U) Deep wells, Well anodes, PEB3723F, WUCEDD021024005

SEARCH CONTROL NO	055028
AD-A082 689	13/2
CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE	
TYNDALL AFB FL DETACHMENT 1 (ADTC)	
(U) Civil and Environmental Engineering Development Office	
(U) Fiscal Year 1980 Technical Objectives Document	
DEC 78	21P
REPORT NO	CEEDO-TR-78-52

## UNCLASSIFIED REPORT

ABSTRACT. (U) This TDG describes the three Technical Planning Objectives developed to guide the conduct of research and development in passive defense techniques for the theater airbase, pavement studies, environmental pollution abatement and control, air mobility concepts, fire fighting equipment and resource/energy conservation. (Author)

DESCRIPTORS. (U) Environmental engineering, Air Force facilities, Air Force planning, Air Force research, Landing fields, Pavements, Corrosion, Airmobile operations, Pollution abatement, Fire fighting, Fire protection, Energy conservation, Civil engineering, Military requirements, Technology forecasting, Defense planning

IDENTIFIERS (U) Technical objectives documents, PEB2601F, PEB3723F, PEB4708F

AD-A082 902  
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 AD-A082 909  
 UNCLASSIFIED  
 PAGE 336 055026

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AD-A082 885 212 13/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
 LUNDGREEN (DALE A) GAINESVILLE FL AD-A082 337 13/2 15/5  
 (U) Low Efficiency Control Measures for Jet Engine Test Cells

DESCRIPTIVE NOTE: Final rept Apr-Sep 78.  
 SEP 78 23P PERSONAL AUTHORS: Lundgreen, Dale A ;  
 CONTRACT NO. F083778-M-1387 REPORT NO. CEDDO-TR-78-20  
 PROJECT NO. 2103 PROJECT NO. 2103  
 TASK NO. 70 TASK NO. 6W  
 MONITOR: CEDDO IDENTIFIERS: (U) PEG3723F, RUCEDD021037001  
 R-78-53

## UNCLASSIFIED REPORT

ABSTRACT: (U) This report summarizes the findings of low cost, relatively low efficiency emission control measures for reduction of jet engine test cell opacity to less than 20%. The recommended cost effective opacity reduction system consists of an effective water spray system; a glass fiber mist eliminator, a medium efficiency, high velocity, throw-away type glass fiber filter media; and a reduced test cell discharge area. The report discusses the following topics: control methods, opacity, scrubbers, deaisters, and filters. (Author)

DESCRIPTIONS: (U) Jet engine exhaust, Air pollution control equipment, Test equipment, Opacity, Cost effectiveness, Water, Sprays, Glass fibers, Water filters, Scrubbers, Gas turbines, Smoke, Particulates

IDENTIFIERS: (U) PEG3723F, RUCEDD021037001

AD-A082 885 212 13/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
 LUNDGREEN (DALE A) GAINESVILLE FL AD-A082 337 13/2 15/5  
 (U) CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
 TYNDALL AFB FL DETACHMENT 1 (ADTC)

DESCRIPTIVE NOTE: Final rept May 75-76-78.  
 MAY 78 172P PERSONAL AUTHORS: Diferbutter, Robert F. ;  
 REPORT NO. CEDDO-TR-78-20  
 PROJECT NO. 2103  
 TASK NO. 6W

## UNCLASSIFIED REPORT

ABSTRACT: (U) This report discusses solid waste management practices within the Air Force. The discussion is organized according to a specific area of the waste management function, namely: type of mission function/activity; generation characteristics; collection/practices; processing activities; disposal characteristics; costs, and recycling. The report includes comparison of waste management practices on a selected command-by-command basis, and with national data. Whenever available (Author)

DESCRIPTIONS: (U) Solid wastes, Waste management, Rations collection, Air Force facilities, Waste disposal, Recycled materials, Cost analysis, Value engineering, Resource management, Conservation, Civil engineering, IDENTIFIERS: (U) MUCEE021038W73, PEG3723F

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CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE			1/5	
TYNDALL AFB FL DETACHMENT 1 (ADTC1)			NAVAL WEAPONS CENTER CHINA LAKE CALIF	
(U) Particile Collection by Water Injection in Test Cells			(U) Geothermal Potential at US Air Force Bases	
DESCRIPTIVE NOTE			Final technical rept Jan 77-Sep 78.	
NOV 70	8P	HWY 78	0IP	
PERSONAL AUTHORS: Dailey, Peter S., Lundgren, Dale A.			PERSONAL AUTHORS Austin, Carl F., Whisman, J. A.	
REPORT NO	CEEDO-TR-78-61	REPORT NO	NAG-TP-6378	
PROJECT NO	2103	CONTRACT NO	PRO-77-0021	
TASK NO	70	MONITOR	CEEDO	
			TR-78-47	

## UNCLASSIFIED REPORT

**ABSTRACT.** (U) This report summarizes the mechanisms by which particiles may be removed when water is injected into turbine engine test cell exhaust streams. The report concludes that impact between solid particiles and droplets is the most important mechanism and that there is an optimum flow rate at which water should be injected to assure maximum removal efficiency. (Author)

**DESCRIPTORS.** (U) Particulates, Exhaust Gases, Air collecting methods, Turbines, Water injection, Air pollution, Smoke, Test equipment, Removal

**IDENTIFIERS.** (U) WUCED021037001, PE63723F

## UNCLASSIFIED REPORT

**ABSTRACT.** (U) The Air Force has completed a study of the geothermal potential of USAF bases. This report lists the power generation potential, space or industrial heating potential, and geopressure potential at each USAF base. This report also discusses in detail the data available for those USAF bases which exhibit the greatest potential for use of geothermal energy. Bases with significant potential that are discussed in detail include: Mountain Home (space heating), Creek Range at Mountain Home (power), Ellsworth Air Force Bases (space heating), Keesler Air Force Base (geopressurized geothermal resource), Hill Air Force Base (space heating), and United States Air Force Base (power). In the Continental United States and Navajo Air Force Base, Hawaii Power, Lakes Air Force Base, Ellsworth Air Force Base, and Atkona Air Station, Air Force Base, Azores (power), and Atkona Air Station, Turkey (space heating) outside of the Continental United States. Open literature and unpublished field studies provided the basis for evaluation. (Author)

**DESCRIPTORS.** (U) Geotherapy, Altitude source facilities, Heating, Power supplies, Natural resources, Steam, Volcanoes, Geology, Azores, Hawaii, Utah, Land use

**IDENTIFIERS.** (U) Hot Springs, Geothermal energy

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AD-A082 138

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DTIC REPORT BIBLIOGRAPHY  
SEARCH CONTROL NO 035028  
AD-A061 684 13/12 1/2 1 / 8  
NAVAL RESEARCH LAB WASHINGTON D C  
(U) Now Agents for the Extinguishment of Magnesium Fires  
Description Collection Scheduling Program  
Volume II Program PHASE2  
DESCRIPTIVE NOTE. Final rept Jan 78-Apr 77.  
APR 78  
30P  
PERSONAL AUTHORS. Zuzzolino, Harold J., Murphy, Edward P.  
REPORT NO. CERF-C-20  
CONTRACT NO. F28B01-78-C-0018  
MONITOR. CEDO  
TR-78-23-VOL-2  
UNCLASSIFIED REPORT  
SUPPLEMENTARY NOTE. See also Volume 3. AD-A060 280  
ABSTRACT. (U) This report describes progress PHASE2, the  
second of four programs in the Air Force Research  
Collection Scheduling Program. Program logic, input  
output, and limitations are presented in detail. Some  
recommendations for changes, a program listing, and  
sample output are included. (Author)  
DESCRIPTIONS: (U) \*Refuse collection, \*Scheduling, Air  
Force procurement, \*Materiel, \*Military facilities, Computer  
programs, \*Military facilities, Subroutine, \*Military  
facilities, \*Health front output processing  
IDENTIFIERS (U) MTRM  
604

SEARCH CONTROL NO 035028  
AD-A061 684 13/12 1/2 1 / 8  
NAVAL RESEARCH LAB WASHINGTON D C  
(U) Now Agents for the Extinguishment of Magnesium Fires  
Description Collection Scheduling Program  
Volume II Program PHASE2  
DESCRIPTIVE NOTE. Final rept Aug 78-Sep 77.  
APR 78  
30P  
PERSONAL AUTHORS. Lawrence, Kenneth D., Williams, Frederick  
W., Gann, Richard G.  
REPORT NO. NRL-8180-378-KDL-FMN-NAS  
CONTRACT NO. NIPR-FY8952-78-65017  
PROJECT NO. 414N  
TASK NO. 10  
MONITOR. CEDO  
TR-78-19  
UNCLASSIFIED REPORT  
SUPPLEMENTARY NOTE. See also Volume 3. AD-A060 280  
ABSTRACT. (U) Ground Glass powders (frits) have been  
evaluated as possible suppressants for magnesium fires  
Conceptually, these would melt and form a glass coating  
on the surface of the burning metal, isolating it from  
the oxygen supply. Some frits containing oxides of  
magnesium and lithium reacted violently with the burning  
magnesium. However, several low melting frits proved to  
be good suppressants and were better than commercial  
suppressants. (Author)  
DESCRIPTORS (U) \*Fire extinguishing agents, \*Aircraft  
Explosions, Landing, High velocity, Breaking, Fract, Glass,  
Powders, Fire suppression, Lithium alloys, Melting  
IDENTIFIERS (U) LPN-AFCEC-PO-77-10, WUCED0414N1005,  
PEG474F

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AD-A061 684

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AD-A081 532 CRINUED  
SCOTT ENVIRONMENTAL TECHNOLOGY INC PLEASSTADVILLE PA  
(U) Air Force Turbine Engine Emission Survey United  
States. Volume 1. Test Summary  
DESCRIPTIVE NOTE. Final rept JUN 73-JUN 78.  
AUG 78 195P  
PERSONAL AUTHORS: Souza, Anthony F. Daley, Peter S.  
REPORT NO. SET-1462-50-0877-VOL-1  
CONTRACT NO. F28601-75-C-0046  
PROJECT NO. 2103  
TASK NO. 2A  
MONITOR CEE00  
TR-70-34-VOL-1  
UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2. AD-A081 605

ABSTRACT: (U) The gaseous exhaust emissions from 14 military gas turbine engines were measured at various power levels from idle to full power including afterburning. SAE smoke number was determined. All measurements were made using the Air Force Mobile Emissions Laboratory which is a self-contained state-of-the-art gas turbine emissions test laboratory. Emission rates of hydrocarbons, carbon monoxide and oxides of nitrogen were calculated. The emission rate of sulfur oxides was estimated from fuel analyses. The body of data was analyzed to show relationships among the data. These studies included the effect of power setting on emission index and smoke number variation of gas concentrations across the exhaust plane and the degree of uncertainty introduced by above and sampling methods. A summary table of best estimate emission factors for all the engines tested is provided. (Author)

DESCRIPTORS (U) Gas turbines, aircraft engines, emission, air pollution, exhaust gases, Turbojet engines, Turbofan engines, Turboshaft engines, Afterburners, smoke, particulates, carbon monoxide, UNCL ASS111 0

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AD-A081 532 PAGE 370 055028

## UNCLASSIFIED

AC-AD01 483 21/5 21/2 13/2

SCOTT ENVIRONMENTAL TECHNOLOGY INC PLUMSTEADVILLE PA

(U) U.S. Air Force Turbine Engine Emission Survey Volume II. Engine Model Summaries.

DESCRIPTIVE NOTE: Final rept Jan 75-Jun 76.

ADN 78 GEP

PERSONAL AUTHORS: Schaefer, Anthony F ; Daley, Peter S

CONTRACT NO. F28001-75-C-0046

PROJECT NO. 2103

TASK NO. 2A

MONITOR: CEDDO TR-78-34-VOL-3

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 058028

AD-AD01 389 13/2 15/3

NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL ENGINEERING RESEARCH FACILITY

(U) Air Force Refuse Collection Scheduling Program Description Volume I Program RCINPT

DESCRIPTIVE NOTE: Final rept Jan 76-Apr 77.

APR 78 157b

PERSONAL AUTHORS: Iuzzolino, Harold J

REPORT NO. CEFIF-EE-19

CONTRACT NO. F28001-78-C-0015

MONITOR CEDDO

CEDDO TR-78-23-VOL-1

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

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Availability: Document partially legible

SUPPLEMENTARY NOTE: See also Volume 1, AD-AD01 532

ABSTRACT: (U) The gaseous exhaust emissions from 14 different gas turbine engines were measured at various power levels from idle to full power, including at afterburning. SEE stock number was determined. The body of data was analyzed to show relationships among the data. These studies included the effect of polar setting on emission index and stock number, variation of gas concentration across the exhaust plume and two degrees of uncertainty introduced by abeyance and sampling methods. A summary table of 'Best Estimate' emission factors for all the engines tested is provided.

DESCRIPTIONS: (U) "Gas turbine", "Air-craft engines", "Air pollution, 70-boiler engines", "Turbofan engines", "Turbofan engines", "Afterburner", "Nodes", "Particulates", "Turbulent", "Carbon monoxide", "Hydrocarbons", "Nitrogen oxides", "Sulfur oxides", "Combustion products", "Afterburning", "Power levels".

IDENTIFIERS (U) MUCEDD021032A10, PEB372JF

AD-AD01 183

UNCLASSIFIED

SUPPLEMENTARY NOTE: See also Volume 2, AD-AD01 986.

ABSTRACT: (U) This report describes Program RCINPT, the first of four programs in the Air Force Refuse Collection Scheduling program. Program logic, input, output, requirements, and limitations are presented in detail. Error messages are listed and corrective procedures are given. Recommended program changes, a program listing, and sample input and output are included. (Author)

DESCRIPTIONS: (U) "Refuse collection", "Air Force, scheduling, computer programs", "Input, output, processing, waste disposal", "Waste/Solid waste engineering", "Subroutine, algorithms".

IDENTIFIERS: (U) FORTRAN

AD-AD01 369

PAGE 371 055028

## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

AD-A081 295 1/5 21/2

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
THOMAS AFB (CL DETACHMENT 1 (ADIC))

(U) Measurement and Analysis of Airport Emissions

Descriptive Note: Interim rept 1 Mar 77-1 Jul 78.

SEP 78

21P

PERSONAL AUTHORS: Orley, Peter S. .

REPORT NO. CEE00-TR-78-30

PROJECT NO 2103

TASK NO 8A

## UNCLASSIFIED REPORT

ABSTRACT: (U) This paper is of interest to those involved in regulation and analysis of aircraft related air pollution problems. USAF efforts to measure and model airport pollution are summarized. Efforts include (1) a joint EPA study at Williams AFB, AZ which involves both modeling and measurement, (2) photographic studies to track plume rise, (3) theoretical model studies to analyze airport pollution. The author concludes that the Williams study, soon to be completed, will greatly aid in determining the accuracy of airport air pollution dispersion models. That air quality modeling studies have shown that state-of-the-art Air Force engines cannot be cost effectively modified to reduce pollution except possibly in the hydrocarbon area and that, at present, unpredictable thermal plume rise of aircraft exhaust renders model ineffective at locations close (<1 km) to the source. (Author)

DESCRIPTORS: (U) Airports, Air pollution, Emission, Aircraft exhaust, Air force facilities, Models, Measurement, cost effectiveness, Modification, Environmental management, Turbines, Engines, Emission control, Case studies, Hydrocarbons, Thermal pollution, Plumes

IDENTIFIERS (U) PES3723F, WUCED0021035A28

SEARCH CONTROL NO 0585248

AN-A081 220 21/5

FLORIDA UNIV (GAINESVILLE DEPT OF ENVIRONMENTAL  
ENGINEERING SCIENCES)(U) The Feasibility of Controlling Turbine Engine, York  
Call Particulate Emissions with a Baghouse

Descriptive Note: Final rept Sep 77-Mar 78.

SEP 78 TAP

PERSONAL AUTHORS: Geiger, John R., Daley, Peter S. .

CONTRACT NO F08637-78-N-1282

PROJECT NO 2103

TASK NO 7A

MONITOR CEE00

TR 78-24

## UNCLASSIFIED REPORT

ABSTRACT (U) Air pollution regulations dictate that the Department of Defense attempt to control visible emissions emitted from turbine engine test cells. Previous studies have similarly dismissed baghouses as a control device because of potential size, pressure drop, explosion and fire hazard, and excessive cost. This report addresses these problems in the design of a baghouse for controlling emissions from a TF30 P100 engine.

DESCRIPTORS: (U) Turbajan engines, Emission control, Air pollution control equipment, Particulates, pressure, Explosions, Fire safety, Filters, Scrubbers, Combustion products, Equations, Heat loss, Gas flow

IDENTIFIERS (U) TR-30 P100 engines, WUCED021037A29

PE03723F

AD-A081 295

AD-A081 120

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N77C REPORT B7D-10GRAPHY

SEARCH CONTROL NO 056029

AD-A080 987 12/2

NEW MEXICO UNIV. ALBUQUERQUE CIVIL  
CARRIERED RESEARCH FACILITY

(U) Air Force Refuse-Coll' action Scheduling Program

Description. Volume IV. Program PHASES.

DESCRIPTIVE NOTE: Final rept Jan 78 Apr 77.

JUL 78 181P

PERSONAL AUTHORS: Tuzzolino, Harold J.; Stand, Patricia.

REPORT NO CERF-EE-23

CONTRACT NO. F28601-78-C-0015

MONITOR: CECDO

TR-78-23-VOL-1

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 3, AD-A080 986

ABSTRACT: (U) This report covers program PHASES, the  
fourth of four programs in the Air Force Refuse-Collection  
Controlled Scheduling Program. Program logic, input,  
output, and limitations are presented in detail. User  
recommendations for changes, a program listing, and  
sample input and output are included. (Author)DESCRIPTORS: (U) Air Force Collection, Air Force  
Scheduling, Algorithms, Computer Programs, Input output  
processing

## UNCLASSIFIED

NEW MEXICO UNIV. ALBUQUERQUE CIVIL  
CARRIERED RESEARCH FACILITY

(U) Air Force Refuse-Coll' action Scheduling Program

Description. Volume III. Proc. "in PHASES

DESCRIPTIVE NOTE: Final rept. Jan 78-Apr 77.

JUN 78 267P

PERSONAL AUTHORS: Tuzzolino, Harold J.;

REPORT NO CERF-EE-21

CONTACT NO. F28601-78-R-0019

MONITOR: CECDO

TR-78-22-10L 3

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 4, AD-A080 987

ABSTRACT: (U) This report describes program PHASES, the  
third of four programs in the Air Force Refuse-Collection  
Controlled program. Input, output, and  
limitations are presented in detail. A program listing  
and sample output are included. (Author)DESCRIPTORS: (U) Refuse collection, Air force  
scheduling, Algorithms, Computer programs, Input output  
processing

AD-A080 987

AD-A080 986

UNCLASSIFIED

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## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

AD-A060 853 12/1 STANFORD UNIV CALIF DEPT OF STATISTICS (U) On the 'Half-Sample' Method for Goodness-of-fit DESCRIPTIVE NOTE: Techniques rept. 18P JUL 78 REPORT NO. TR-260, TR-20 CONTRACT NO. NAR0914-78-C-0478, DAAGD8-77-G-0031 UNCLASSIFIED REPORT

AD-A060 842 21/2 13/2 SCOTT ENVIRONMENTAL TECHNOLOGY INC PLUMSTEADVILLE PA (U) J57-BSW Engine Emission Test Report.

SEARCH CONTROL NO. 085028

DESCRIPTIVE NOTE: Final rept. Nov 78-Dec 77. JUL 78 9AP PERSONAL AUTHORS: Stephens, Michael A. PERSONAL AUTHORS: Souza, Anthony F., Scott, Harold A., Jr.; REPORT NO. SET-1628-02-1177 CONTRACT NO. F08833-77-C-0216 MAINTCR: CECNO UNCLASSIFIED REPORT 1R-7A-37

ABSTRACT: (U) Two interesting processes, related to the empirical distribution function, have been pointed out by Rao (1972) and by Durbin (1972). The second, in particular, leads to the half-sample method, an elegant and simple technique for dealing with unknown parameters in goodness-of-fit testing, without the necessity of new tables of percentage points for each distribution tested. To those who have spent some effort in producing such tables, it is natural to wonder whether this effort has been in vain. This paper shows that the answer is no.

DISCREPANCY: (U) Distribution functions, Statistical tests, Tables(Data), Exponential functions, Normal distribution, Normalizing(Statistics), Chi square test

IDENTIFIERS: (U) Goodness of fit tests, NAR0914-78 IDENTIFIERS: (U) J-57 engines, J-57-P-59W engines

## UNCLASSIFIED REPORT

ABSTRACT: (U) The exhaust emissions from three J57-P-59W water injected turbojet engines were measured. Emission rates of hydrocarbons, carbon monoxide and oxides of nitrogen were calculated. Smoke opacity and particulate loadings were also measured. Best estimate emission factors are presented (Author)

DESCRIPTIONS: (U) Turbojet engines, Exhaust gases, Water injection, Hydrocarbons, Carbon monoxide, Nitrogen oxides, Smoke, Opacity, Particulates, Measurement, Test methods, Sampling, Air pollution

IDENTIFIERS: (U) J-57 engines, J-57-P-59W engines

## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

AD-A030 458 13.1

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DEPARTMENT 1 (ADIC)(U) Third Interior Technical Report on USAFA Solar Test  
House Design Parameters.

DESCRIPTIVE NOTE: Report for May 77-Apr 78.

SEP 70 184P

PERSONAL AUTHORS: Edan, Anthony ; Timaley, John T. ;

REPORT NO. CEE00-TR-78-32

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Original contains color plates. All  
DOC reproductions will be in black and white.

**ABSTRACT:** (U) This report describes the continuing performance of the first retrofitted, solar-heated facility in the USAF, the Solar Test House at the USAF Academy. Continued efforts to improve the performance have been a further reduction of the storage tank voltage and installation of make-up water system to work in conjunction with the bleed air valves. The thermography studies started during the previous research period were completed and the techniques of using this advanced procedure for displaying flow patterns validated. The data analysis for the Solar Test House shows the improvement to the efficiency of the total system's ability to supply thermal energy to the structure. Finally, the various parameters used to design the solar energy systems originally are analyzed and shown to be valid for this application. (Author)

**DESCRIPTORS:** (U) Solar heating, Heating plants, Performance (Engineering), Efficiency, Housing (Buildings), Prototypes, Energy storage, Heat transfer, Heat exchangers

IDENTIFIERS: (U) LPM-CEE00-70-07C-2-108

## UNCLASSIFIED

## SEARCH CONTROL NO 095028

AD-A059 983 21.4

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADIC)(U) FLAME - Forestry Lands Allocated for Managing Energy.  
Feasibility Study

DESCRIPTIVE NOTE: Final rept. Jun-Aug 78.

SEP 78 28?

PERSONAL AUTHORS: Loxther, James O. ;

REPORT NO. CEE00-TR-78-41

PROJECT NO. 2103

TASK NO. 30

## UNCLASSIFIED REPORT

**ABSTRACT:** (U) This study evaluated the feasibility of using wood grown on USAF installations as fuel to supply the heating energy requirements of the installations, replacing conventional fossil fuels currently being used. Arnold Engineering Development Center, Tennessee; Barkdale AFB, Louisiana; Eglin AFB, Florida; and Tyndall AFB, Florida, have the potential for supplying significant portions of their heating energy requirements with non-renewable timber grown on the installations. Avon Park Air Force Range, Florida has the potential to supply its own fossil heating energy requirements plus those of MacDill AFB, which is 75 miles away. Arnold Engineering Development Center presently has a central plant heating system that can be converted to a wood-burning system by altering existing boilers or replacing them with boilers having wood-burning capability. The remaining installations do not have central plant heating systems, but use small natural gas and oil-fired heating units in individual buildings. Conversion of these installations to burn wood would require construction of a wood-fired central system. An alternate method of converting these installations is through the use of a pyrolysis unit to convert wood to fuel gas and fuel oil which can be burned in existing heating units. The latter alternative cannot be implemented until a large scale, continuously operated pyrolysis unit is developed. (Author)

AD-A030 458

AD-A059 983

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AD-A059 093

CONTINUED

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 053026

AD-A059 978 21/5 0/0

DESCRIPTIONS: (U) \*Fuels, \*Forests, \*Wood, Feasibility studies, Air Force facilities, Heating, Military requirements, Costs

IDENTIFIERS: (U) PEE3723F, WUCEDD031038003

DESCRIPTIONS: (U) Fuel, \*Forests, \*Wood, Feasibility requirements, Costs

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYPICAL AFB FL DETACENT 1 (ADTC)

(U)

Air Quality Analysis of Possible F-15 and A-10 Aircraft Engine Modifications to Reduce Pollution

DESCRIPTIVE NOTE Final rep: May 77-May 78.

JUN 78

32P

PERSONAL AUTHORS: Naugle, Dennis F.; Daley, Peter S.; Scott, Harold A., Jr.

REPORT NO: CEDDO-TR-78-35

PROJECT NO: 2103

TASK NO: SA

## UNCLASSIFIED REPORT

ABSTRACT. (U) The Air Force has established goals for the control of aircraft engine exhaust emissions. Neither the F-15 nor A-10 aircraft engines completely meet these goals even though they are much less polluting than the F-4E and A-7 aircraft. They often replace this study compares air quality impacts of all four aircraft and shows the relative improvements possible with a modification/retrofit program for the F-15 and A-10 aircraft. Significant improvement is obtainable only for the A-10 hydrocarbon emissions. A five step analytical methodology is presented and can be adapted to nearly any aircraft related air quality assessment problem. (Author)

DESCRIPTORS. (U) \*Turbofan engines, \*Gas turbines, \*Modifications, \*Exhaust gases, Emissions control, Systems analysis, Specifications, Air pollution, Impact, Air quality, Hydrocarbons, Carbon monoxide, Nitrogen oxides, Smoke, Test and evaluation, Fighter aircraft, Jet bombers  
IDENTIFIERS. (U) A-10 aircraft, F-15 aircraft, F-4E aircraft, A-7 aircraft, F-100 aircraft, PEE3723F  
WUCEDD031038A21

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AD-A059 978

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## DTIC REPORT BIBLIOGRAPHY

AD-A050 057 13/2 11/0 SEARCH CONTROL NO. 055028

AD-A050 857 CONTINUED

## MISSOURI UNIV-COLUMBIA DEPT OF CIVIL ENGINEERING

(U) Optimum Dewatering and Metal Recovery of Metal Plating Waste Sludges.

DESCRIPTIVE NOTE: Final rept May 78-Feb 78.

KAR '78 73P

PERSONAL AUTHORS: Novak, John T., Holroyd, John ; Patterson, L. Larry, Ghosh, Arindra K.

CONTRACT NO. F0863A-76-C-0223

PROJECT NO. 2103

TASK NO. 7W

MONITOR: CEE000

TR-78-15

## UNCLASSIFIED REPORT

ABSTRACT: (U) Bench scale experimentation was initiated to evaluate the solubility and sludge characteristics associated with selected heavy metals and their hydroxides for both homogeneous and heterogeneous solutions. Data suggests that in a mixed-metal solution, metal-metal co-precipitate form and the point of zero charge (pzc) for these precipitate depends upon the specific metal content of the colloidal precipitants. In general, the presence of chalcocite (Cu<sub>2</sub>S) depresses the overall pzc while nickel and cadmium, when major was a component, had no effect on the pzc. Aging was found to impact chalcocite dewatering but it is not clear what the theoretical aspects of aging chemistry can be used to predict changes. High molecular weight anionic polymers were effective in conditioning metal sludges with respect to cake formation/filtrate clarity but help dewatering rates very little. Previously developed correlations for inorganic sludges which utilized filtration dewatering processes based on gravity and vacuum thickening data were found to hold for metal sludges. Based on these relationships and the laboratory data gathered here, it is concluded that vacuum filtration is the only reasonable process to insure a handleable sludge if direct reclamation of the metals from the mixed

AD-A050 957

A9-A059 57

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 050508  
AD-A059 511 13/2 CONTINUED  
SCS ENGINEERS LONG BEACH CALIF  
(U) Cascade Water Reuse  
DESCRIPTIVE NOTE: Final rep Oct 74-Dec 76.  
PERSONAL AUTHORS: Schmidt,Curtis J ;Clements,Ernest V  
KII;Shelton,Stephen P ;  
CONTRACT NO: F33601-75-C-0019  
PROJECT NO. 2100  
TASK NO. 6W  
MONITOR: CEDDO  
TR-77-10

IDENTIFIERS. (U) WUCEDD021030145, PE33723F

CONTRACT NO: F33601-75-C-0019

UNCLASSIFIED REPORT

ABSTRACT: (U) The water reuse model described in this report was developed to assist Air Force personnel in reusing wastewater on Air Force bases. The model aids in selecting the most cost effective methods of wastewater collection, treatment and reuse in base activities. The model is comprised of two separate phases. Phase I provides a basis of activities summary to simplify and clarify reusable cascade couplings between activities. With this as a foundation, feasible activity cascade networks can be developed for input into Phase II of the model. Phase II provides the following data for each of these networks: (1) Requirements for piping and storage; (2) Required treatment efficiencies and treatment chains; (3) Estimated total reuse system costs (water purchase, discharge fees, piping, pumping, storage, and treatment). In developing this model, the contractor gathered pertinent information relating to water quality and quantity demands of various base activities and the extent of degradation through use, along with specific data gathered at individual bases. This information was used to test the cascade reuse mode at Davis-Monthan and Hurlach Air Force Bases to evaluate reuse potential at Andrews Air Force Base and to aid in the conception and actual design of treatment and reuse facilities at Peterson Air Force Base. The user's manual for use of the computer software for this model is published as CEDDO TR-

AD-A059 511

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 095028

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AD-A059 121 1/5 15/5

11/4

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE

TYNDALL AFB FL DETACHMENT 1 (ADTC)

(U) The Evaporation and Dispersion of Hydrazine

Propellant from Ground Spills.

DISCRIMINATING NOTE: Final rept. Jul 77-Jul 78.

AD 78 64P

JAN 78 127P

PERSONAL AUTHORS: 1116. Gerhard Springer, Charles T.

McHorney, Michael T.

REPORT NO. CEDDO-TR-78-30

REPORT DATE: 10/00

PROJECT NO. 2104

TASK NO. 2B

10/00

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) A propellant evaporation and dispersion model has been developed for hydrazine ground spills. The evaporation algorithm computes the rate of evaporation as a function of soil temperature, solar insulation, air temperature, wind velocity and spill dimensions. The single source Gaussian dispersion portion calculates the downwind dispersion centerline available concentration based on dispersion coefficients available in current EPA models. The dispersion algorithm also computes the crosswind dispersion of a hazard corridor defined by the Short Term Public Limit (STPL) or other selected concentrations.

DESCRIPTORS: (U) hydrazine, air pollution, dispersion, prediction, Spilling, Ground level, evaporation, Air pollution, Air quality, Environmental tests, Algorithms, Computer programs, Machine coding, Soil mechanics, Solar radiation, Wind velocity, Hazardous materials

IDENTIFIERS: (U) WUCEDD0190005A35. PEB2861F

DESCRIPTORS: (U) Runways, \*Taxisways, \*Repair, \*Composite materials, Polymers, Concrete, Pavement bases, Laboratory tests, Stress analysis, Failure mechanics, Materials laboratories, Tensile strength, Road damage, Maintenance, High strength, Theses

IDENTIFIERS: (U) PEB3723F, WUCEDD01042827

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DTIC REPORT BIBLIOGRAPHY

AD-A058 800 0/1 13/7

CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY)  
ILL

(U) Development of a Pavement Maintenance Management  
System, Volume V, Proposed Revision of Chapter 3,  
AFR 03-5.

DESCRIPTIVE NOTE Final rept Jul 76-Sep 77.

OCT '77 193P

PERSONAL AUTHORS: Shahin, Mohamed Y., Darter, Michael X.;  
Kohn, Steven D.

REPORT NO. CERL-TR-C-76-VOL-5

PROJECT NO. 2104

TASK NO. 34

MONITOR: CEEDO  
TR-77-44-VOL-5

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE. See also Volume 1, AD-A058 884

ABSTRACT: (U) The Air Force has for several years been actively engaged in the development of a Pavement Maintenance System. The first accomplishment of this study was the development of improved procedures for determining the relative condition of airfield pavements. These improved procedures are presented in detail in this report. These procedures were developed during FY 76 and 78, and validated by field tests during FY 78 and 77. The conferences, attended by Command Pavement Engineers from all Major Commands, have been held at Tyndall AFB, Florida (20 Nov - 2 Dec 1978 - 20 October 1977), to discuss and revise those procedures. It was the consensus of the attendees that the main concern was that these procedures provided vastly improved methods for determining the relative condition of airfield pavements. Thus, CEDO was requested, during the conference held in October 1977, to publish, in some form, instructions for the use of these procedures as soon as possible. As a result this technical report is being published in the same format as that used for Chapter 3, "Airfield Pavement Condition Survey Report."

AD-A058 800

AD-A058 880

UNCLASSIFIED

SEARCH CONTROL NO 035020

CONTINUED

AD-A058 800 AFR 03-5. The Air Force Civil Engineering Center (AFCEC), at Tyndall AFB, Florida, has the responsibility for revising AFR 03-5. It is recommended that the information presented in this report be used as a basis for revision of Chapter 3, AFR 03-5 (Author).

DESCRIPTORS: (U) Pavements, runways, airports, Maintenance Management, Air force facilities, test and evaluation, Symposia, Air force research, Regulations, Surveys

IDENTIFIERS: (U) Pavement maintenance management system, Airfield Pavement Condition Index, LPN-CERDD-77-01C, MUCEE021043M1, PEG3725F

## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A058 852 13/12 13/7 14/2

AD-A058 243 13/2 7/3 11/7 14/2

NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL  
CHINEERING RESEARCH FACILITY

(U) Development of High-Pressure Liquid Chromatographic  
Techniques (Phase II),

DESCRIPTIVE NOTE: Final rept. Nov 76-Sep 77.

APR 78 4BP

APR 78 87P

PERSONAL AUTHORS: Jablonsek, Edwin J ;

REPORT NO. NAL-0180-197-EU-NJS

PROJECT NO. 414N

CONTACT NO. F28001-78-C-0013

TASK NO. 40

PROJECT NO. 2103

TASK NO. 2C

MONITOR: CEDDO

MONITOR: CEDDO

TR-78-1

TR-78-1

## UNCLASSIFIED REPORT

ABSTRACT: (U) A large-scale fire test program was conducted to evaluate the relative fire-fighting effectiveness of applying aqueous film forming foams (AFFF) through commercially available air-aspirating and non air-aspirating nozzles. The Navy NO-1 and P-4; and Air Force P-4 aircraft fire-rescue vehicles were used as nozzle test-beds. Nozzles with rated capacities of 200 gpm and 750 to 1000 gpm were tested and evaluated on 6000 square feet and 8000 square feet (18' x 110') fuel fires, respectively. Eight of the 18' x 110' fires conducted contained an aircraft mock-up. The lower aspiration, more fluid, longer reach nozzles (in forming a film) generated with the non air-aspirating type nozzles were found to provide superior fire extinguishing effectiveness compared to the air-aspirating type nozzles. Air-aspirated foams required approximately 50 percent longer to achieve 90 percent fire control than the non air-aspirated foams. No discernible difference in burnback resistance was found for either type of foam. (Author)

DESCRIPTORS: (U) fire fighting, spray nozzles, fire extinguishing agents, foam, fast and evaporation, comparison, aircraft fires

IDENTIFIERS: (S) LPN-AFCEC-P0-77-018, SUCEED014H4001, PDE4714F

AD-A058 852

UNCLASSIFIED

DESCRIPTIVE NOTE: Final rept. Jul 78-Sep 77.

APR 78 87P

PERSONAL AUTHORS: Mathews, James R ; Pierce, Glenn D ;

REPORT NO. F28001-78-C-0013

PROJECT NO. 2103

TASK NO. 2C

MONITOR: CEDDO

TR-78-1

## UNCLASSIFIED REPORT

ABSTRACT: (U) The Organics-Carbon Adsorbable Minifilter procedure was used to recover refractory organics from treated wastewater. Ten carbon chloroform extracts were recovered with this procedure. A parallel run using pulsed versus nonpulsed carbon beds was made to compare the recovery efficiencies of the beds. Five parallel runs were made to compare the ability of activated carbon and XAD-2 macroreticular resin to concentrate trace organics. An improved recovery system was developed and evaluated; this system recovered a greater organic mass per gram of carbon and per unit volume of sample than the Organics-Carbon Adsorbable Minifilter and gave measurable recoveries in 24 hours.

DESCRIPTORS: (U) "Wastewater," "Organic compounds," "Refractory materials," "Liquid chromatography," "Activated carbon," "Refractory formation," "Effluent," "Environmental tests," "Adsorbents," "Chloroform," "Extraction," "Beds (process engineering)," "Trace elements," "Samplers," "Filters," "Biochemical oxygen demand"

IDENTIFIERS (U) PEB3723F, WUEEE021032C4

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AD-A058 239	21/4	7/3	DTIC REPORT BIBLIOGRAPHY	SEARCH CONTROL NO 055026
CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE TYNDALL AIR FORCE BASE, FLORIDA 32284			AD-A058 239	CONTINUED
(U) OXIDATION OF HYDRAZINE IN AQUEOUS SOLUTIONS				IDENTIFIERS (U) FG02001F, WUCEDO19004CC01
DESCRIPTIVE NOTE: Interim rept. 6 Jan 77-1 Jan 78.				
MAR 78	37P			
PERSONAL AUTHOR'S NAME: MacNaughton, Michael, D.		; Urda, Gregory A		
REPORTS BY: Bowden, Sam E				
REPORT NO.	CEDO-TR-78-11			
PROJECT NO.	1900			
TASK NO.	4C			

UNCLASSIFIED REPORT

ABSTRACT: (U) The expanded use of hydrazine type fuels throughout the Air Force makes it imperative that current and accurate data be available on the potential environmental impact of these compounds. This report describes the chemistry of hydrazine in aqueous solutions under varying conditions of temperature, pH, ionic strength, salinity, hydrazine concentration, catalysts, and solid substrates. Results indicate that in the absence of copper 2 (II) catalyst, the degradation of hydrazine is slow. In five days a 2% loss of hydrazine at 1000 molal solution of hydrazine degraded less than 2% in distilled water, 40% in pond water and 20% in seawater. The addition of oxida and clay solids did not change the rate of degradation. Increasing the concentration of copper 2 caused a major increase in the oxidation rate as did increasing temperature, salinity and ionic strength. Changes caused minor variations in rate. The maximum degradation rate occurs between pH 5 and 9. Oxygen concentrations in the range 0.5 to 40 mg/l had no measurable effect. (Author)

DESCRIPTORS: (U) Aviation fuels, hydrazine, oxidation-reduction reactions, water-soluble materials, environmental protection, temperature, pH factor, ionization, salinity, concentration (chemistry), oxygen, catalysis, distilled water, sea water, copper, clay, nonpropellents

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## DTIC REPORT BIBLIOGRAPHY

AD-A050 875 1/5

CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN ILL

(II) Development of a Pavement Maintenance and Repair Guidelines for Airfield Pavements

DEScriptive Note: Final rept 1 Oct 73-30 Sep 77.

SEP 77 122P

PERSONAL AUTHORS: Shahin Mohamed Y .Darter, Michael T .Kohn, Starr D .

REPORT NO. CERL-TR-C 76-Vol. 3

PROJECT NO. 2104

1 ASK NO. 3M

MONITOR: CEDO TR-77-46-Vol-3

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 1, AD-A048 884

ABSTRACT: (U) This report describes the development of guidelines for maintenance and repair of (M and R) needs of airfield pavements. The guidelines are based on the Pavement Condition Index (PCI) and other condition indicators, including rates of deterioration, change of deterioration, load carry capacity, skid resistance, hydroplaning, surface roughness, and extent of previous M and R. The and R needs were divided into three general categories: routine, major, and overall. The mean pavement PCI was found to relate strongly to M and R needs represented by these three M and R categories. M and R zones for use in selecting the appropriate M and R category were established based on the mean pavement PCI. Other condition indicators are used to further aid in the selection of feasible M and R alternatives. Recommendations M and R methods for the different distress types and severity levels were developed. Economic analysis procedures were developed for comparing M and R alternatives. The airfield pavement condition survey and rating procedures have been successfully field tested. Performing the condition survey according to these

AD-A050 875

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AD A050 575

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A055 987 13/2

NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL  
ENGINEERING RESEARCH FACILITY

(U) Refuse-Collection Scheduling for Selected Locations

Volume III Fairchild Air Force Base, Washington

DESCRIPTIVE NOTE: Final technical rept Jan 76-Apr 77.

NOV 77 62P

PERSONAL AUTHORS Iuzzolino, Harold J

REPORT NO CERF-EE-15

CONTRACT NO F28001-70-C-0015

MONITOR CEDCO

13-77-54-VOL 2

UNCLASSIFIED REPORT

619

SUPPLEMENTARY NOTE: See also Volume 4, AD-A055 718

ABSTRACT: (U) This report presents maps and schedules produced by the Air Force refuse-collection scheduling program for residential refuse collection at Fairchild Air Force Base, Washington. The data required for scheduling are discussed briefly. The computer-generated schedule reduced the number of trips from 10 to 8 and the total mileage from 272 8 to 264 4 miles (Author)

DESCRIPTORS: (U) •Refuse collection, scheduling, Air Force facilities, Computer applications

Availability Document partially illegible

SUPPLEMENTARY NOTE See also Volume 3, AD-A056 172

ABSTRACT: (U) This report presents maps and schedules produced by the Air Force refuse-collection scheduling program for residential refuse collection at Hill Air Force Base, Utah. The data required for scheduling are discussed briefly. The computer-generated schedule reduced the number of trips from 4 to 3 and the total mileage from 50 4 to 44 5 miles (Author)

DESCRIPTORS: (U) •Refuse collection, scheduling, Air Force facilities

AD-A056 172

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AD-4055 988  
13/2

## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

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ENGINEERING RESEARCH FACILITY  
NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL  
ENGINEERING RESEARCH FACILITY

(U) Refuse-Collection Scheduling for Selected Locations  
Volume I Offutt Air Force Base, Nebraska

DESCRITIVE NOTE: Final technical rept Jan 78-Apr 77.

NOV 77 61P

PERSONAL AUTHOR: Iuzzolino, Harold J. ;

REPORT NO. CERF-EE-13

CONTRACT NO. F28801-78-C-0015

MONITOR: CERF

TR-77-84-VOL-1  
UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Volume 2, AD-4055 9887

ABSTRACT: (U) This report presents maps and schedules produced by the Air Force Refuse-Collection Scheduling Program for chapter-type refuse collection at Offutt Air Force Base, Nebraska. The data compiled for scheduling and the difficulties encountered in chapter-type collection are discussed briefly. The total mileage of the three trips required to collect refuse was reduced from 40.3 to 30.7 miles (Author)

DESCRIPTORS: (U) Refuse collection. Scheduling. Air Force facilities

AD-4055 716 13/2

NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL  
ENGINEERING RESEARCH FACILITY

(U) Refuse-Collection Scheduling for Selected Locations.  
Volume IV Robins Air Force Base, Georgia

DESCRITIVE NOTE: Final rept Jan 78-Apr 77.

NOV 77 154P

PERSONAL AUTHOR: Iuzzolino, Harold J. ;

REPORT NO. CERF-EE-17-VOL-4

CONTRACT NO. F28801-78-C-0015

MONITOR: CERF

TR-77-84-VOL-4  
UNCLASSIFIED REPORT

AVAILABILITY: Document partially illegible

SUPPLEMENTARY NOTE: See also Volume 1, AD-4055 988.

ABSTRACT: (U) This report presents maps and schedules produced by the Air Force Refuse-Collection Scheduling Program for residential refuse collection at Robins Air Force Base, Georgia. The data required for scheduling are discussed briefly. The computer-generated schedules produce the number of trips from 27 to 22 and the total mileage from 148.1 to 124.3 miles. (Author)

DESCRIPTORS: (U) Refuse collection. Scheduling. Air Force facilities

AD-4055 988

AD-4055 710

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## UNCLASSIFIED

AU-HONS 487 13/2 21/8 1 CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE TYNDALL AIR & FL. DETACHMENT 1 (EDC)

(U) "The Autoxidation of Hydrazine Vapor

DESCRIPTIONS: (U) Final report Nov 15-Dec 77.

JAN 78

46P

PERSONAL AUTHORS: Stoen, Daniel A.

REPORT NO: AFCELD-TR-78-17

PROJECT NO: 187D

REPORT

TASK NO: 4C

IDENTIFIERS: (U) PRE23017, MUCEDD19064C01

UNCLASSIFIED REPORT

ABSTRACT: (U) Results of three studies on the ambient temperature autoxidation of hydrazine vapor are presented. These studies show that the main reaction is  $H_2N_2 + O_2 \rightarrow N_2 + 2H_2O$ , with carbon being produced as a side product. The rate of the twin reaction, as well as the rate of reaction producing ammonia, is greatly influenced by the surface to volume ratio and the surface composition of the reaction vessel (hydrazine/half life varied from a few minutes to several hours depending upon experimental conditions) (author)

DISCRIPTORS: (U) Hydrazine, Liquid rocket fuels, Oxidation, Air pollution, Air, Chemical reactions, Semiconductor plants, Volume, Surface properties, Environments, Nitrogen, Water vapor, Acetonid

IDENTIFIERS: (U) PRE23017, MUCEDD19064C01

## AFIC REPORT DIGIGRAPHY

SEARCH CONTROL NO: 055026

AD-A055 095 5/3 9/2 13/1 10/1

CONSTRUCTION ENGINEERING RESEARCH LAB (CERL): CHAMPAIGN ILL

(U) Field Test of Building Energy Analysis Tools and

Procedures

DEScriptive Note: Interim rept.

MAY 78 BPP

PERSONAL AUTHORS: Little, Douglas C.

REPORT NO: CERL-TR-E-129

PROJECT NO: 4A7B2731AT41

TASK NO: 09

MONITOR: CEDDO

REPORT: TR-77-38

## UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes the results of the field test of three building energy analysis tools. (1) Building Loads Analysis and System Thermodynamics (BLAST) Program, (2) Predicting the Performance of Solar Energy Systems, and (3) Use of the Building Loads Analysis and System Thermodynamics Program to Perform Total Energy System Analysis Projects to which BLAST was applied included a flight simulator training facility, administrative buildings, and a hangar-administration building. Results showed that these tools can be effectively and usefully applied to the analysis and design of energy conservative buildings. However, extensive revision of the draft BLAST User's Manual was recommended. The recommended revisions were accomplished prior to the publication of the User's Manual in December 1977. Widespread dissemination and use of these energy analysis tools is recommended.

DESCRIPTORS: (U) Energy management, Buildings, Computer programs, Systems analysis, Energy consumption, Mathematical prediction, Energy conservation, Field tests, Air conditioning equipment, Heating, Performance(Engineering), Solar heating, Military facilities, Programming manuals

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AD-A055 055	CONTINUED	DTIC REPORT BIBLIOGRAPHY	SEARCH CONTROL NO. 055028
IDENTIFIERS.	(U) BLASER computer program, PEG2731A, AST4; PM121	AD-A054 194	21/9 13/2
		CIVIL PAD ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE: TYNDALL AFB FL DETACHMENT 1 (ADTC)	
		(U) Proceedings of the Conference on Environmental Chemistry of Hydrazine Fuels, Tyndall AFB, 13 September 1977	
		DESCRIPTIVE NOTE: Final rept.	
		MAR 78 102P	
		REPORT NO. CIECO-TR-78-14	
		PROJECT NO 1900	
		TASK NO 4C	
		UNCLASSIFIED REPORT	

ABSTRACT: (1) On 13 September 1977, the Civil and Environmental Engineering Development Office, ADIC, Tyndall AFB, Florida, hosted a conference on the environmental chemistry of hydrazines used for missile fuels and isomorphallants. A total of 14 papers were presented on the following general topics related to hydrazine fuels: (1) Sources and Control of Fuels Emissions and Spills (2) Environmental Monitoring Techniques and Instrumentation (3) Analysis of Fuels and Degradation Products (4) Fate of Hydrazines in the Environment (Author)

DESCRIPTORS (U) Hydrazine, Rocket fuels, Air pollution, Conference (communications) Reports, Analytical chemistry, Exhaust gases, Emission control, Hydrazine derivatives, Degradation, Toxicity, Combustion

IDENTIFIERS: (U) NUCECO 10004C01, PEO2801F

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AD-A054 194

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## UNCLASSIFIED

AD-A054 004 4/1 30/4 CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE TYNDALL AFB FL DETACHMENT 1 (ADTC) (u) Photographic Measurements of USAF Aircraft Plume Rise DESCRIPTIVE NOTE: Final rep't 1 JUL-22 May 77.  
NOV 77 3NP PERSONAL AUTHORS: Hause, Paul D.; Hunt, Jerry S.; Hugle, Dennis F.; REPORT NO. CEDO-TR-77-57 PROJECT NO. 1800 TASK NO. 2A

AD-A053 087 21/6 13/2 1/3 CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE TYNDALL AFB FL DETACHMENT 1 (ADTC) (u) Subsonic/Inert Sampling Errors for Aircraft Turbines Engine Smoke Probe.

DISCREPATIVE NOTE: Final rep't 15 Sep 77-15 Jan 78.  
APR 78 20F PERSONAL AUTHORS: Martone, Joseph A.; REPORT NO. CEDO-TR-78-21 PROJECT NO. 1800 TASK NO. 2A

## UNCLASSIFIED REPORT

623

ABSTRACT: (u) This report includes data and results which were obtained during plume rise experiments. Aircraft plumes were photographed using the subsonic-proceding F-102 drone, and Thunderbird F-38 aircraft. The second set of experiments indicated that, under low wind and neutral conditions, no aircraft plume rise separates from the ground. The other studies, however, indicate that under high wind and neutral conditions, the plume rise is greatly retarded and there is no significant ground separation. Differences in plume meteorology apparently account for these plume rise variations. Since the 13 tests performed are inadequate to understand the causes for the plume rise and ground separation, it is recommended that this study be extended in order to provide an explanation for this phenomenon.

DESCRIPTORS: (u) \*Exhaust plumes, \*Jet engine exhaust, \*Photographic analysis, \*Convective/thermospheric, \*Lift, Air pollution, Air quality, Mathematical models

IDENTIFIERS: (u) F-102 aircraft, T-38 aircraft, PEG26U1F, MPEC2D019002A77

## UNCLASSIFIED REPORT

ABSTRACT: (u) Experimental evidence that subsonic/inert sampling can be important for subsonic/interceptor particles in high speed flow was presented in CEDO-TR-77-15. This report applies those results to gas turbine engine smoke measurement. The analysis predicts a 15 to 30 percent subsonic/inert sampling error at take-off engine power setting. It is concluded that subsonic/inert errors do not greatly affect smoke number determinations but should be considered when true smoke density is measured. (Author)

DESCRIPTORS: (u) \*Gas turbines, \*Aircraft engines, \*Smoke, \*Sampling, \*Aerosols, \*Exhaust gases, \*Supersonic flow, \*Density, \*Measurement, \*Emissions

IDENTIFIERS: (u) 180kinetic sampling, Sonic flow, PEG2801F, MPEC2D019002A10

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## UNCLASSIFIED

AD-A053 802 6/6 214 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 058028  
 CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE AD-A053 683 14/2 18/4 1/5  
 TYNDALL AFB FL DETACHMENT 1 (ADTC) WOODWARD CLYDE ASSOCIATES SAN FRANCISCO CA  
 (U) Equipment to Neutralize Aircraft Fuel Spills (U) Identification and Characterization of Elements for an  
 DESCRIPTIVE NOTE: Final rept Sep 78-Sep 77. Air Force Range Planning Document.  
 DEC 77  
 PERSONAL AUTHORS: Monroe, Lee R.; Liskauer, William H.; Spight, Tom K.;  
 CONTRACT NO. F08635-76-D-0134  
 PROJECT NO. 1997  
 REPORT NO. CEDD-77-78-08  
 TASK NO. 9  
 PROJECT NO. 414N  
 TASK NO. 10  
 UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes the selection of types and sizes of equipment for the neutralization of base and other type fuel spills. Additionally, it deals with the procurement of subject equipment and materials; and, evaluates, on a competitive basis, for application to collection, neutralization, and fabrication of various size fuel spills. Maximum use was made of US Army Mobility Equipment Research and Development Command's in-house facilities to design, manufacture, fabricate, and test a pilot model system as described in the report. (Author)

DISCRIPTORS: (U) Aviation fuels. \*Oil spills. Water. Separators. Army equipment. (Author)

IDENTIFIERS (U) REGA7147. WCEED0414N1004

UNCLASSIFIED REPORT  
 ABSTRACT: (U) This report identifies and characterizes those elements which should be included in range planning documents which may be prepared for air-to-ground ranges. The report identifies nine major elements with each having from three to six sub-elements. The discussion on each element includes: Characterization; Rationale; Use of Element at Various Levels of Command; and Outline of Sub-elements. This report will be used during a follow-on range planning effort in Land-Use Planning and Compatible Use Zones. (Author)

DISCRIPTORS: (U) \*Ranges(facilities). \*Air Force facilities. Test facilities. Weapon delivery. Air to surface. Site selection. Land use. Air Force training. Mission. Air space. Legislation. Air Force planning. Environmental protection. Community relations.

IDENTIFIERS: (U) PEG3723F. WUCED019879542

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055026

AD-A053 255 13/2

NEW MEXICO UNIV ALBUQUERQUE FRIC & MNR CIVIL  
ENGINEERING RESEARCH FACILITY

(U) Air Force Refuse-Collection Scheduling Program

DESCRIPTIVE NOTE: Final technical rept. Dec 73-Apr 77.

JAN 78 71P

PERSONAL AUTHORS: Buzzatino, Harold J. :

CONTRACT NO: F28601-76-C-0015

MONITOR: CECDO

YR: 77-78

## UNCLASSIFIED REPORT

ABSTRACT: (U) Data preparation for and use of the four computer programs comprising the Air Force Refuse-Collection Scheduling Program (RCSP) are described. RCSP is used to produce maps and printed schedules for residential refuse collection (Author)

DISCUSSIONS: (U) \*Refuse collection, Scheduling, Routing, Air Force facilities, Computer programs, Heaps, Algorithms, Waste management

## UNCLASSIFIED REPORT

ABSTRACT: (U) Brominated resins were evaluated in the laboratory for regenerating ferricyanide bleaches from Air Force photocolorizing laboratories. Several resins were tested to determine bromine transfer rates. Results showed the technique is technically feasible but too complicated and hazardous for small photo labs (Author)

DESCRIPTIONS: (U) \*Photographic materials, \*Photographic processing, \*Bleaching agents, \*Cyanides, \*Iron compounds, Bromination, Regeneration, Engineering, Chemical reactions, Photographic images, Photographic developers, Silver compounds, Particles, Oxidation reduction reactions

IDENTIFIERS (U) PEB93723F, WUCED001037W20

## UNCLASSIFIED

DTIC REPORT SIGHTGRAPHY SEARCH CONTROL NO 055028  
 AD-A053 070 CONTINUED  
 TENNESSEE UNIV KNOXVILLE DEPT OF CIVIL ENGINEERING  
 (U) Development of a Regionalized Mathematical Model for  
 Predicting Changes in Streamflow Quantity and Quality  
 as a Function of Land Use, Soil Type and Rainfall  
 Characteristics. (U) PTE02001F, WUCED010005W24

DESCRIPTIVE NOTE: Final rept 5 Jun 78-1 Jun 77.

JAN 78 110P

PERSONAL AUTHORS: Overton, Donald E., Ninear, Roger A.

Salton, Stephen P. ;

CONTRACT NO: F08335-78-C-0247

PRODUCT NO. 1900

TASK NO. 5H

MONITOR: CEDDO

TR-77-18

## UNCLASSIFIED REPORT

ABSTRACT. (U) This study was designed to regionalize a mathematical model for streamflow runoff which can be used for predicting changes in streamflow quantity and quality as a function of land use, soil type, and rainfall characteristics. A water quality index was developed which responds as a function of land use and hydrologic characteristics. The index includes physical, chemical, and biological parameters. The model was regionalized for immediate use in the Tennessee Valley on selected watersheds up to approximately 10 square miles using hydrologic data from urban, agricultural, forested, and strip mining watersheds. However, in future studies the model can be regionalized to other parts of the United States by analysis of hydrologic, air, and water quality data in those regions utilizing the same scientific approach. In this study in the Tennessee Valley, results achieved from other regions can then be pooled with results achieved from the Tennessee Valley which would provide a more widely applicable model. (Author)

DESCRIPTORS: (U) "Water flow", "Runoff, Mathematical model", "Water quality", "Water table", "Land use", "Soils", "Rainfall", "Hydrographic surveying", "Tennessee River".

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DTIC REPORT BIBLIOGRAPHY		SEARCH CONTROL NO	055028
AD-A053 008	13/13	AC- A052 707	1/5 13/2
CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE TYNDALL AFB FL DETACHMENT 1 (ADTC)		CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE TYNDALL AFB FL DETACHMENT 1 (ADTC)	
(U) Hardwall Expandable Shelter		(U) Nondestructive Pavement Evaluation	
DESCRIPTIVE NOTE. Final rept Apr 73-Aug 77.		DESCRIPTIVE NOTE. Final rept. 1 Oct 78-30 Sep 77.	
SEP 77	88P	OCT 77	22P
PERSONAL AUTHORS. Sugg, Joseph P.		PERSONAL AUTHORS. Dan, R. W. :	
REPORT NO	CEEDO-TR-77-45	REPORT NO.	CFEDO-TR-77-41
PROJECT NO	2054	PROJECT NO	2054
TASK NO	20	TASK NO	4P

## UNCLASSIFIED REPORT

ABSTRACT: (U) The Air Force awarded a contract to Brunswick Corporation for the development of a basic rigid/expandable shelter that would fulfill various user requirements with little or no change in the shelter design. Furthermore, the shelter was to be compatible with both air and surface transport criteria. Extensive testing verified that the shelter meets these two basic criteria. However, design details need revision to improve watertightness and reduce shelter gross weight. The Air Force should adopt the hardwall expandable shelter (HES) as a standard for meeting future tactical shelter requirements. (Author)

DESCRIPTORS: (U) •Portable shelters, expandable structures. Air transportable equipment. Shipping containers. Aluminum. Watertightness. Stress testing. Honeycomb structures. Walls. Air-Force equipment. IDENTIFIERS: (U) Hardwall expandable shelters. WUCED020542002. PEB#7037

ABSTRACT. (U) Research has been in progress for about 10 years to develop a compatible pavement evaluation procedure for airfields based on nondestructive tests. A successful nondestructive pavement evaluation technique will reduce the time of closure of various airfield facilities needed to conduct destructive tests required for conventional pavement evaluation. This study provides a comparison of the projected pavement life of several airfield features estimated by nondestructive and destructive pavement evaluation procedures for aircraft and ground loading similar to pavements in the nondestructive evaluation programs. While higher numbers of allowable operations as compared to that obtained by destructive test evaluation techniques at this point in the research effort, follow-on research is planned which will cause the two evaluation procedures to yield more closely compatible numbers. (Author)

DESCRIPTORS: (U) •Runways. •Nondestructive testing. Pavements. Life cycles. Comparison. Loads (forces). Destructive tests. Field tests. Elastic properties. Structural analysis. Vibrations (mechanics). Concrete. Modulus of elasticity. Computer programs. Shear properties. IDENTIFIERS: (U) WUCED020544P07. PEB#7037  
TAC NO. NT-010380

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AD A052 707

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## DTIC REPORT BIBLIOGRAPHY

AD-A052 707

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IAC DOCUMENT TYPE: NTIAC - MICROFICHE --

IAC SUBJECT TERMS: N--(U) PAVEMENTS, RESEARCH, AIRPORTS, EVALUATION, FIELD TESTS, LIFE(MOBILITY), LOAD(FORCES), DESTRUCTIVE TESTS, SHAR, ELASTIC PROPERTIES, STRUCTURAL ANALYSIS, AIRCRAFT, CONCRETE, COMPUTER PROGRAMS, COMPUTER PROGRAMS, PROPERTIES, COMPUTER PROGRAMS, PROPERTIES.

SEARCH CONTROL NO: 055028

AD-A051 687 13/12 1/2

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
SYNTHETIC AIRS PL. DETACHMENT 1 (ADIC)

(U) Fire Fighter Tools

DESCRIPTIVE NOTE: Final rept. 1 Oct 76-31 Oct 77.

JAN 78

CSP

PERSONAL AUTHORS: Knowles, Norman D. ;

REPORT NO: CELD-TR-78-2

PROJECT NO: 414N

TASK NO: 30

## UNCLASSIFIED REPORT

ABSTRACT: (U) The Civil and Environmental Engineering Development Office (CEEDO) conducted an evaluation of aircraft crash rescue/fire fighting tools and equipment. This study was necessitated due to the continued growth and development of new tools and the ever increasing numbers of tools being acquired by Air Force Fire Protection Organizations. The purpose of the study was to verify the concepts for fire fighting and rescue operations; to identify the tools and equipment presently carried on fire fighting and rescue vehicles; to determine the usefulness of all inventoried tools and equipment; and to determine a basic selection of tools and equipment that should be carried on fire fighting and rescue vehicles.

DESCRIPTORS: (U) \*Fire fighting, \*Fire extinguishers, \*Firefighting vehicles, \*Aircraft fires, Crash landing, Rescue equipment, Rescue vehicles, Tools

IDENTIFIERS: (U) VICEED014N3001, PEG4714F

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DTIC REPORT BIBLIOGRAPHY

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AD-A050 999 14/2 11/4

GENERAL AMERICAN TRANSPORTATION CORP NILES ILL GENERAL  
AMERICAN RESEARCH DIV

(U) Nondestructive Inspection of Shelter Panels.  
Minaturized Nondestructive Inspection Tester Model 1

DESCRIPTIVE NOTE: Final rept Mar 78-Jun 77.

JUL 77 17P

PERSONAL AUTHORS: Santoro, Michael J ;

CONTRACT NO. F33615-76-C-5274

PROJECT NO 2054

TASK NO 20

MONITOR: OEGDO

TR-77-47

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Rept No AFCEC-TR-76-2. AD-A007 033

ABSTRACT. (U) This report summarizes the results of an effort to develop a minaturized model of the nondestructive inspection prototype equipment developed under Contract F-33615-76-C-1552. The details of the initial equipment development have been documented in AFCEC-TR-76-2, Jan 1975. The minaturized model has been successfully laboratory and field tested and the results of these tests are included along with conclusions and recommendations (Author)

DESCRIPTORS. (U) "Test equipment", "Nondestructive testing", "Sandwich panels", "Electronic equipment", "Minaturization", "Sheets", "Portable equipment", "Moisture", "Lamination", "Field tests", "Bonding"

IDENTIFIERS. (U) PEG4721F, MOCEED020542004

IAC NO HT-016123

IAC DOCUMENT TYPE: NTIAC - MICROFICHE --

TAC SUBJECT TERMS: N-(U)TEST EQUIPMENT

AD-A050 999

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AD-A050 999  
MODELS(SIMULATIONS), PROTOTYPES, DEVELOPMENT, RECOMMENDED  
PRACTICES, FIELD TESTS, BONDING, LAMINATES, PORTABLE  
EQUIPMENT, SANDWICH CONSTRUCTION, PANELS(STRUCTURAL),  
MOISTURE, ELECTRIC EQUIPMENT;

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## UNCLASSIFIED

AD-A050 223 8/8 1/3  
 CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
 TYNDALL AFB FL DATA CENTER 1 (ADTC)

(U) Smoke Abatement for DOD Test Cells.

DESCRIPTIVE NOTE: Final Rept 20 Nov 76-30 May 77.

JUL 77 10SP

PERSONAL AUTHORS: Grimes, Bradford C - III.

REPORT NO. CENDO-TR-77-40

PROJECT NO. 2103

TASK NO. 7A

## UNCLASSIFIED REPORT

ABSTRACT (U) The Department of Defense owns and operates nearly 200 jet engine test cells. Occasionally, visible exhaust smoke is emitted from these structures. Several pollution control agencies, most notably the State of California, have expressed interest in halting test cell smoke emissions. A review committee composed of various Air Force and Navy representatives recommended further study of fuel additives as a means of achieving this goal. They recognized additives as the best promising means to combat the test cell smoke problem. Ferrocene appeared to be the best of existing additives. Studies were undertaken to determine the environmental impact, toxicological hazards and engine effects associated with routine ferrocene use. Four types of Navy turbine engines were tested for ten hours each using ferrocene. These tests indicated that engines suffered no harm attributable to ferrocene, but that the additive must be certified for each engine type on an individual basis. Emission measurements made during the tests showed that most pollutants are virtually unchanged in quantity and character by ferrocene use and that particulate matter is actually reduced.

DESCRIPTORS: (U) \*Smoke abatement. \*Ferrocenes. \*Air pollution. \*Test facilities. Fuel additives. Environmental management. Jet engine fuels. Jet engine exhaust. Test fixtures. Cost analysis. Naval research. Air Force research. Test and evaluation. Air quality

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DTIC REPORT BIBLIOGRAPHY  
 SEARCH CONTROL NO 055028  
 AD-A050 223 CONTINUED  
 IDENTIFIERS: (U) PEG03723F, WUCFED021037A28

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AD-A049 712 13/2 8/10 7/3  
 STANFORD UNIV CALIF DEPT OF CIVIL ENGINEERING  
 (U) The Role of Iron Sulfides in Controlling Trace Heavy  
 Metals in Aqueous Sediments: Oxidative Dissolution  
 of Ferrous Monosulfides and the Behavior of Associated  
 Trace Metals

DESCRIPTIVE NOTE. Final rept 5 Dec 74-4 Dec 76.

FEB 77 416P

PERSONAL AUTHORS: Nelson, Michael B.; Davis, James A.; III;  
 Benjamin, Mark W.; Leckie, James O.

CONTRACT NO. F28601-75-0-0028

PROJECT NO. 2103

TASK NO. 4C

MONITOR CETO  
 TR-77-13

## UNCLASSIFIED REPORT

ABSTRACT: (U) The study of the kinetics of oxidation of the ferrous monosulfide minerals and the fate of the associated heavy metals are important to a better understanding of the processes and mechanisms controlling the release, transport, and retention of heavy metals in natural aquatic systems. This project undertook a detailed study of several selected aspects of the aqueous chemistry of heavy metals and of the oxidative dissolution of FeS(s) and the fate of associated heavy metals both during and after the oxidation reaction. The material is organized into sections dealing with the basic aqueous chemistry of iron and sulfur, silver, cadmium, adsorption models, experimental methodology, results and discussion.

DESCRIPTORS (U) "Iron," "Sulfides," "Heavy metals," "Water pollution," "Adsorption," "Sediments," "Cadmium," "Silver," "Ligands," "Cooperite compounds," "Chloride compounds," "Particulates," "Anaerobic processes," "Precipitates," "Trace elements," "Transport properties," "Water quality," "Environments," "Wastes (industrial)," "plating," "Photographic processing."

AD-A049 712

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AD-A048 827 8/8 7/4 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
 CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE AD-A048 480 13/1 10/1 10/2 13/2  
 TYNDALL AFB FL DETACHMENT 1 (ADTC) CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
 TYNDALE, AFB FL DETACHMENT 1 (ADTC)

(U) Chlordane Volatility (U) Survey of Considerations for Solar Energy Facility  
 DESCRIPTIVE NOTE: Final rept. Jun 78-May 77. Applications  
 PERSONAL AUTHORS: Stauffer, Thomas B. DESCRIPTIVE NOTE: Final rept. .  
 REPORT NO. CEE00-TR-77-4 DEC 77  
 PROJECT NO. 2103 PERSONAL AUTHORS: May, Marshall W. Jr.;  
 TASK NO. 4C REPORT NO. CEE00-TR-77-38  
 UNCLASSIFIED REPORT

## INCLASSIFIED REPORT

ABSTRACT: (U) The volatility of technical grade chlordane from different surfaces was studied. The vapor concentration over 0.72% water solution of pooled liquid technical grade chlordane was .13 mg/l. The vapor concentration was also determined for Ottawa sand, pea gravel, and top soil. Technical grade chlordane is a complex mixture of chlor dane and heptachlor isomers and conformers. It was found that the components of the technical grade pesticide volatilize from different surfaces at different rates. Individual component concentrations were measured over the various surfaces studied. The 't-test' was used to check for significant component volatilization differences from the various surfaces. (Author)

DESCRIPTORS: (U) "Chlordane," Volatility, Evaporation, Rates, Vapor pressure, Surface properties, Concentration (Chemistry), Water soluble materials, Foundations, Sand, Gravel, Soil tests, Foundations (structures), Test methods, Test equipment, Air flow, Temperature, Humidity

IDENTIFIERS: (U) FEE3723F. CEE0021034C00

ABSTRACT: (U) The purpose of this report is to provide Air Force Civil Engineering some useful information on the planning and programming of solar energy systems to satisfy military energy requirements. This report has been prepared in response to the belief that considerable interest in solar energy system technology, as well as other alternate energy schemes, is increasing at a rapid pace in the Air Force. A considerable effort is devoted to appraising the current status of fossil fuel energy resources in order to establish the need for expanded work in developing solar energy technology. The current and potential areas of application of solar energy technology are described with special attention devoted to space heating. Additionally, environmental considerations of solar energy technology are described along with the current Air Force solar energy program. This report concludes with some suggestions for establishing a solar energy program on an individual or installation basis. (Author)

DESCRIPTORS: (U) "Solar heating, Air Force facilities, Energy management, Solar energy, Solar collectors, Technology forecasting, Space heaters, Detroffiting, Cost estimator, Abolization, Air Force planning, Fossil fuel, Resource management, Energy consumption, Energy conversion, Photovoltaic effect, Heat pumps, Air conditioning equipment, Military requirements, Remote areas

IDENTIFIERS: (U) Environmental Impact

IAC NO. PL-900904  
 AD-A048 480  
 UNCLASSIFIED PAGE 397 055028

## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY		SEARCH CONTROL NO	055028
AD-A049 490	CONTINUED		
		6/6	6/3
			22/4
CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE TYNDALL AFB FL DETACHMENT 1 (ADTC)			
(U) Impact of Space Shuttle Support Facilities Construction on Special Interest Plant Species (Vandenberg AFB, CA)			
DESCRIPTIVE NOTE      Final rept. Jun-Sep 77.			
SEP 77      6IP			
PERSONAL AUTHORS      Wooten, R. C. , Jr., Strutz, Dennis ; Hudson, Ronald ;			
REPORT NO      CEDDO-TR-77-33			
PROJECT NO      2103			
TASK NO      8			

## UNCLASSIFIED REPORT

ABSTRACT (U) This report summarizes the results and conclusions of studies conducted to evaluate the impact of ground support facility construction for the Space Shuttle program at Vandenberg AFB, California on listed and proposed threatened or endangered plant species in order to comply with the Endangered Species Act of 1973. Vegetation surveys were made in proposed construction site areas. The listing used to determine threatened and endangered plant taxa were those plant species proposed as endangered or threatened in the 1975 Federal Register (40FR27824-27880) and those listed as endangered or threatened by the US Fish and Wildlife Service in the June 10, 1978 Federal Register (43FR24524-24572). The surveys also included other special interest taxa designated by the California Native Plant Society as being rare, endangered, or vascular plants of limited distribution in California. Three threatened species (Castilleja mollis, Monardella crispa, and Scrophularia atrata) and two endangered species (Cirsium rhothophilum and Eriogonum foliosum var. blochmaniae) were found in a number of the construction site areas. It was determined that construction activities would not jeopardize the continued existence of any of these species. Mitigative measures were recommended to minimize adverse plant habitat modification or removal of any of these plants (Author)

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DTIC REPORT BIOGRAPHY      SEARCH CONTROL NO. 655628

AD-A049 177      CONTINUED      AD-ANSA 1-2      6/5      15,4

DESCRIPTORS: (U)      \*Ecology, \*Plants(Botany), \*Air Force, facilities, \*Environmental impact statements, \*Ground extinction, \*Impact evaluation, Space shuttles, Ground support, Sites, Construction, Environmental protection

IDENTIFIERS: (U)      Vandenberg Air Force Base, WOCEEC21039P13, PE63723F

AD-AD49 177      CONTINUED      AD-ANSA 1-2      6/5      15,4

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

(U)      An Evaluation of Cladocera as a Bioassay Organism

DESCRIPTIVE NOTE:      Final rept. 1 Oct 75-4 Feb 78

JUN 78      36P

PERSONAL AUTHORS:      Scott, Claudio L.; Moorehead, Annie

REPORT NO:      AFCEC-TR-78-37

PROJECT NO:      2103

TASK NO:      3E

UNCLASSIFIED REPORT

ABSTRACT: (U)      The literature review of Cladocera, with special emphasis on Daphnia, was conducted to assess their use in aquatic pollution research and new methods to measure the effects of pollution on the aquatic ecosystem. A discussion on life cycle, metabolism, cycloformosis, filtering rate, culture techniques, toxicity, and taxonomy is included (Author)

DESCRIPTORS: (U)      Crustacea, Aquatic animals, Fresh water, Water quality, Indicators, Sensitivity, Bioassay, ecosystems, Environmental tests, Water pollution, literature surveys, Ecology, Life cycles, Metabolism, toxic tolerances, Taxonomy

IDENTIFIERS: (U)      \*Daphnia, Cladocera, WOCEEC21039P13, PE63723F

## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

AD-A048 028	1/5	13/2	5/1	CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN ILL	SEARCH CONTROL NO	055020		
(u) Development of a Pavement Maintenance Management System. Volume 13 Airfield Pavement Distress Identification Manual						AD-A048 382	(3/1)	9/2
DESCRIPTIVE NOTE: Final rept Jul 74-Jul 76.						CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN ILL		
DEC 77	115P	PERSONAL AUTHOR: Shahin, Mohamed Y ;Dertar, Michael I ;Korn, Starr D		PERSONAL AUTHOR: Hittle, D C	REPORT NO	CERL-TS-E-19-Vol-2		
REPORT NO	CERL-TR-E-79-Vol-2	PROJECT NO	4A782731AT41	2102				
CONTRACT NO	WIFR-F04982-76-06005	TASK NO	00	01				
MONITOR	CEEDO	MONITOR	CEEDO	TR-77-35-Vol-2				

## UNCLASSIFIED REPORT

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE. Supplementary Rept no AFCEC-TR-76-27-Vol 2 dated Nov 76. AD-A042 053 See also Volume 1. AD-A048 384

ABSTRACT. (u) This manual is designed to provide airfield pavement inspectors with a comprehensive reference for pavement distress identification. The information is to be used in conjunction with procedures presented in Volume 1 of this report to determine pavement condition and maintenance and repair requirements. The types of airfield pavement distresses are listed alphabetically under the major categories of asphalt- or tar-surfaced pavements and jointed concrete pavements. Definitions, descriptions, severity levels, and measurement or count criteria are presented for each distress type (Author)

DESCRIPTORS. (u) "Pavements, Maintenance Management, Concrete, Asphalt, Cracking (Fracturing), Cracks, Classification, Loads (Forces), Repair, Surveys

635

## SUPPLEMENTARY NOTE. See also Volume 1. AD-A048 714

ABSTRACT. (u) The Building Loads Analysis and System Thermodynamics (BLAST) program is a sophisticated set of subprograms for predicting energy consumption in buildings. The four major subprograms are: the input processor, which parses the high level input language and sets up the building/systems/plant descriptors, the building loads subprogram, which computes the hourly space load in a building or zone based on the user's description of the building (e.g., building boundary, the air distribution system simulation subprogram, which calculates the coil energy demands, fan power, etc., based on the user's description of the air handling system and the hourly space load due to calculating previous subprograms, and the central energy plant simulation subprogram, which calculates energy consumption of a central/centralized energy plant based on the user's description of the plant and the hourly coil loads calculated by the previous subprograms, and performs a life-cycle cost analysis of the plant). In addition to conventional boiler-chiller equipment, the central energy plant subprogram includes solar heating and cooling systems, total energy systems, and commercial utility systems. The program is written in Control Data

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AD-A048 902

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AD-A047 829 13/2 14/2 21/2 DDC REPORT BIBLIOGRAPHY SEARCH CTRNTRD NO 0100213  
CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TWIDALL AFB FL DETACHMENT 1 (ADIC)  
(U) Sampling Submicrometer Particles Suspended in Near  
Sonic and Supersonic Free Jets

DESCRIPTIVE NOTE: Final rept. 23 Jul 75-15 Dec 70.

OCT 77 21P

PERSONAL AUTHOR(S) Hartone, Joseph A ; Daley, Peter F. ;  
Boudoul, Richard W. ;

REPORT NO. CEDO-TR-48

PROJECT NO. 1000

TASK NO. 2A

UNCLASSIFIED REPORT

Availability: Microfiche copies only

ABSTRACT: (U) This investigation was concerned with sampling submicrometer particles in supersonic free shear flows. Aerosol particles having a number mean diameter of 0.6 micrometers and a geometric standard deviation of 1.26 were accelerated to Mach 0.6, 0.8, 1.28, or 1.47 through a flow nozzle. Aerosol mass concentrations were determined using a small bore probe in the jet and by a large bore probe sampling downstream of the nozzle. The results of both samplers were compared to the sampling error associated with the high speed jet sampler. Studies at Mach 0.6 with four sampling ports having inlet wall to bore area ratios ranging from 1.6 to 0.20 (a knife edge) demonstrated that probe wall thickness effects are not significant when the probe is extracting high velocity. Subisokinetic experiments using the knife edge probe showed relative errors of 124 + or - 12 percent when sampling at 20 percent of the isokinetic condition. The subisokinetic results are compared favorably with the extant empirical results of other authors. For the supersonic cases it is shown that the subisokinetic velocity downstream of the sampling probe which can be used in estimating the sampling error (author)

SCRIPTORS: (U) \*Aerosols. \*Sampling. \*Jet engine  
AD-A047 829

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## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

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**CONTINUED**

Corporation (CDC) FORTRAN Extended, Version 4, and can be used on CDC 8000/7000 series computers without major modifications. This volume is the reference manual for BLAST and contains descriptions of all BLAST subprograms, as well as structural descriptions of algorithm charts where appropriate.

## DESCRIPTIONS:

(II) \*Energy management, \*Buildings, Subroutine, Flow charting, \*Algorithm, Centralized, Heating plants, Air conditioning equipment, Ventilation, Thermal insulation, Meteorological data, Energy consumption, Thermal stresses, High level language, Computer program documentation.

IDENTIFIERS. (U) IUCEDD021020103, AST41, PER0731A, PEB03723P, WU012, WU021

SEARCH CONTROL NO 058028

AD-A048 884

1/6 13/2 8/1

CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN ILL

(U) Development of a Pavement Maintenance Management System Volume 7 Airfield Pavement Condition Rating

DESCRIPTIVE NOTE. Final rept JAI 74 Jul 78.

DEC 77 232P

PERSONAL AUTHORS. Shahin, Mohamed Y, Gartner, Michael I, Kohn, Starr D

REPORT NO. CERL-TR-C-76-VOL-1

CONTRACT NO. MAPR-FQB652-76-00005

MONITOR CEEUO

TR-77 44-VOL-1

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE. Supersedes a report no. AFCEC-TR-76-27, AD-A041 401 See also Volume 2, AD-A048 029

**ABSTRACT.** (U) This report describes the development and verification of a pavement condition index (PCI) for rating the condition of jointed concrete and asphalt-on-tar-surfaced airfield pavements. The PCI, which measures airfield pavement structural integrity and surface operational condition, is calculated based on measured pavement distress types, severities, and densities obtained during an inspection of the pavement. Volume 1 of this report presents distress types, description, severity levels, and measurement criteria for use in performing the pavement inspections.

**DESCRIPTORS.** (U) \*Pavements, \*Runways, \*Maintenance Management, Concrete, Asphalt, Surveys, Classification, Ratings, Deformation, Inspection, Maintenance, Repair, Cracking (fracturing)



## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY				SEARCH CONTROL NO	055026
AD-A047 286	13/2	1/5	9/2	AD-A047 272	13/2
AROGRAN NATIONAL LAB ILL				CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE TYNDALL AFB FL DETACHMENT 1 (ADTC)	
(U) Air Quality Assessment for Air Force Operations - Long-Term Emission/Dispersion Computer Code Documentation				(U) Evaluation of a New Trickling Filter Media	
DESCRIPTIVE NOTE: Final rept 1 Jul 75-1 Jan 77.				DESCRIPTIVE NOTE: Final rept Mar-May 76.	
APR 77				JUL 77 34P	
PERSONAL AUTHORS: Bingham, Dorothy J.				PERSONAL AUTHORS: Ation, Dale H.	
PROJECT NO: 1800				REPORT NO: CEDDO TR-77-23	
TASK NO: 9A				PROJECT NO: 210A	
MONITOR: CEDDO				TASK NO: 7W	

## UNCLASSIFIED REPORT

639

**ABSTRACT:** (U) The Air Force contracted with Argonne National Laboratory to develop a series of computer programs designed to assess the air quality impact of Air Force operations at the airbase level. This report serves as computer code documentation for the Long-Term Emission/Dispersion Model of that effort. Descriptions of the computer codes corresponding to both the original version called the Research Model and the modified version called the Applications Model of the Long-Term Model are included. The manual contains flow charts, code listings, and brief descriptions of each routine contained in the model. It is intended primarily for readers with a computer programming background who wish to examine or alter the computer codes.

**DESCRIPTIONS:** (U) Air quality, Air force facilities, Programming manuals, Air pollution, Airports, Aircraft exhaust, Computer programs, Coding, Computerized flow simulation, Emission, Dispersion, Assessment, Flow charting, Subroutines

**IDENTIFIERS:** (U) PEB2801A, MIPO76003

**ABSTRACT:** (U) An evaluation to determine the effectiveness and loading parameters of a fused silica synthetic media filter known under the trade name of Gary Glas was undertaken. A 15-inch pilot scale trickling filter was set up at the Albuquerque Sewage Treatment Plant using clarified secondary effluent. A laboratory scale trickling filter was installed using three vaultes. Synthetic sewage, primary filtered sewage, and Albuquerque sewage results from the pilot scale filter indicate low removal efficiency. Laboratory scale filter tests indicate low efficiency using an effluent from another laboratory scale trickling filter. The laboratory scale filter achieved in excess of 90 percent Chemical Oxygen Demand (COD) removal using a sugar and milk solids synthetic sewage. The laboratory scale filter reduced COD of Albuquerque secondary sewage by 60-75 percent. There is no evidence to indicate that this synthetic media achieved better results than any other media for use in trickling filters. (Author)

**DESCRIPTORS:** (U) Filters, Fused silica, Sewage treatment, Synthetic materials, Pilot studies, Waste treatment, Effluent, Laboratory equipment, Laboratory tests, Removal, Porous materials, Surface chemistry, Adsorption, Biodeufferation, Microorganisms

**IDENTIFIERS:** (U) Trickling filters, Gary glass, PEB3723F

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## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

AD-A047 181 13/2

## PURDUE RESEARCH FOUNDATION LAFAYETTE IN

(U) Nondestructive Determination of Pavement Deflection under Moving Loads

DESCRIPTIVE NOTE: Final rept Dec 74-Dec 78.

AUG 77

327P

PERSONAL AUTHORS: Harr, M. E. :Ng-A-Qui, N. T.

CONTRACT NO. DOT-F473NA1-381, F40801-78-C-0037

MONITOR: FAA-RD CEDO

77-127, TR-77-56

## UNCLASSIFIED REPORT

**ABSTRACT:** (U) This report presents a procedure for nondestructively evaluating and predicting the deflection response of various flexible pavements to loads imposed by different aircraft. Transfer function theory is used to form the basis of a pavement evaluation and response scheme. Two mobile systems were developed for the scheme. Two mobile systems were developed for the evaluation of pavement deflections: the Light Emitting Diode (LED) system and the Linear Variable Differential Diode (LVDT) system. The report concludes that the Transfer function (LVDT) system rapidly nondestructive measurement of pavement deflections due to moving prototype loads is feasible and that a total nondestructive evaluation scheme based entirely on the use of prototype loads and measured deflections can be fabricated to evaluate and predict instantaneous response and cumulative effects of loads of various magnitudes and configurations. (Author)

**DESCRIPTORS:** (U) \*Runways, \*Pavements, Nondestructive testing, Deflection, Loads, Forces, Light emitting diodes, Load distribution, Transfer functions, Aircraft landings, Mathematical models, Dynamic response, Recording systems, Test methods, Test equipment, Landing Impact, Nation

**IDENTIFIERS:** (U) C-135 aircraft, C-131 aircraft, C-120 aircraft, F-4 aircraft, Transfer function theory, Linear variable differential transformers

YAC NO. NT-015579

YAC DOCUMENT TYPE: NTIAC - MICROFICHE --

AD-A047 181

## UNCLASSIFIED

AD-A047 181

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YAC SUBJECT TERMS: N--(U)PAVEMENTS, DEFLECTION, LOADS, FORCES, LIGHT EMITTING DIODES, LOAD DISTRIBUTION, TRANSFER FUNCTIONS, THEORY, MATHEMATICAL MODELS, RECORDING SYSTEMS, TEST METHODS, TEST EQUIPMENT, MOTION, PREDICTIONS, LINEARITY, PROTOTYPES;

SEARCH CONTROL NO 058028

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AD-A047 004 1/5 8/13 13/8 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE CONTINUED  
TYNDALL AFB FL (DETACHMENT 1 (ADTC)) AD A047 004

(1) Membrane Encapsulated Soil Layer (MSEL) for  
Contingency airfields

DESCRIPTIVE NOTE: Final rept May 78-Feb 77.

APR 77 84P REPORT NO. CEDDO-TR-77-21

PROJECT NO. 2054

TASK NO. 44

## UNCLASSIFIED 1 REPORT

ABSTRACT. (U) This study was conducted to evaluate thickness requirements for membrane encapsulated soil layers (MSEL) having various surfacing materials when subjected to 100 passes of F-4C aircraft loading and to determine the feasibility of constructing thin layers (5 to 8 inches) of MSEL on low strength subgrade A test section consisting of five items was constructed and trafficked. All five items were constructed on a prepared subgrade having a rated California Bearing Ratio (CBR) of 7. Thicknesses of MSEL base courses were 9, 6, 7, 9, and 7. Thicknesses for items 1 through 5, respectively. Surfacing material consisted of 4 inches of asphaltic concrete on items 1 and 2, 2 inches of asphaltic concrete on item 3, only the waterproof surfacing of the MSEL on item 4, a synthetic surf on item 4A, and a 1-1/2-inch thick sand on item 5. The significant findings of this study are that (1) thin MSEL base courses can be constructed over a 7 CBR subgrade, (2) a MSEL with only the waterproof surface will structurally withstand 10 coverages of F-4C traffic but may be rendered susceptible to water due to wrinkling of the waterproof surfacing under traffic, (3) a MSEL is susceptible to infiltration of water when overlaid with a layer of wet material such as sand, and (4) a MSEL base course 7 inches thick with a 2-inch surfacing of asphaltic concrete constructed on a 7 CBR subgrade will withstand 14 coverages (approximately 140 passes) of F-4C traffic. (Author)

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 035028  
AD-A048 970 CONTINUED  
13/13 9/2  
NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL  
ENGINEERING RESEARCH FACILITY  
(U) Adaptation of SAP IV Computer Code to Aircraft Shelter  
Analysis Program.

DESCRIPTIVE NOTE. Final rept Nov 75-Jun 76.

JUN 78 192P

PERSONAL AUTHORS: Schreyer, Howard L.; McCharen, Joe  
Berglund, Jerry W.

CONTRACT NO F29601-78-C-0015

MONITOR: AFSEC  
TR-78-31

UNCLASSIFIED REPORT

ABSTRACT: (U) This report is concerned with the adaptation of a linear, static and dynamic structural analysis computer code (SAP IV) to aircraft shelter structural components. A number of features were added to the documented version of SAP IV to decrease the time and effort necessary to set up practical problems. The Free Format Input program enables the user to input data without the confusing and restrictive format rules of the original version. To aid in finding errors in element layout, a versatile mesh plot package has been included enabling the user to generate report quality output time histories. A specific procedure for approximating the nonlinear behavior of cracked concrete has been developed and is included in this report. Although SAP IV is designed to treat large numbers of different types of elements, this study was directed specifically at three element types: thin shell or plate, thick shell or plate, and beam. These elements were considered as most applicable to the aircraft shelter problem. The FFP and mesh plotting routines are applicable only to these three elements. While the time history plotting capability will function with all the elements presently in SAP IV.

(author)  
DESCRIPTORS. (U) Structural analysis, Shelters, Computer applications, Linear systems, Aircraft, Mathematical analysis, Loads (forces), Construction.

AD-A048 970

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## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

AD-A046 807 13/2 5/1

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADTC)(U) CIVIL and Environmental Engineering Development Office  
Fiscal Year 1978 Technical Objectives Document

NOV 77

27P

REPORT NO. CEE00-TR-77-49

## UNCLASSIFIED REPORT

**ABSTRACT:** (U) This TOD describes the four technical planning objectives developed to guide the conduct of research and development in passive defense techniques for the theater airbase, pavement studies, environmental pollution abatement and control, air mobility concepts, energy conservation, fire fighting equipment, air base support, and warm fog dispersal (Author)

**DESCRIPTORS:** (U) Civil engineering, planning, environmental engineering, environmental protection, fire protection, fire fighting, vehicle, energy conservation, research management, pollution abatement, pollution, corrosion, corrosion inhibition, fog dispersal, airports, corrosion inhibitors

(U) PEG4708F, PEG1723F, PEG2601F

(U) PL-000626\*

TAC NO

TAC DOCUMENT TYPE: PLASTC - HARD COPY --

JAC SUBJECT TECHS: P-1 (U) Energy conservation, management programs, review, R and D, environmental control, corrosion resistance, fog resistance, shelters, flame retardants, military applications, launch pads, paving, 22 MTOE, 22 Unlited;

## SEARCH CONTROL NO 055028

AD A046 348 13/2 1/6 3/2

ARGONNE NATIONAL LAB ILL

(U) Air Quality Assessment Model for Air Force Operations - Short-Term Emission/Dispersion Computer Code Documentation

DESCRIPTIVE NOTE: Final rept 1 Jul 75-1 Jan 77.

APR 77 200P

PERSONAL AUTHORS: Bingham, Dorothy J.

PROJECT NO 1900

TASK NO SA

MONITOR: CEE00-TR-78-34

## UNCLASSIFIED REPORT

**ABSTRACT:** (U) The Air Force contracted with Argonne National Laboratory to develop a series of computer programs called the Air Quality Assessment Model (AQAM) to source emissions inventory routine. AQAM was designed to handle complex emission sources with emphasis on aircraft. A short term emission dispersion model for hourly air quality predictions and a long term emission/ dispersion model for monthly and annual predictions are also in AQAM. This report documents only the short term model. AQAM's computer listings, and brief descriptions of each subroutine are included. They are intended for readers with a computer background who wish to examine or alter the computer code (Author)

**DESCRIPTORS:** (U) Air quality, Air Force facilities, terminal flight facilities, Computer simulation, Air pollution, Aircraft exhaust, Short range (time), Pollutants, Emission, Dispersion, Machine coding, Computer programs, Subroutines, Flow charting, Assessment

(U) LPN-CEE00-70-0003, MUCED019005A03, PE62001F

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AD-A048 341 1/5 20/11 SEARCH CONTROL NO 098028  
 NEW MEXICO UNIV ALBUQUERQUE ERIC H WARD CIVIL CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
 ENGINEERING RESEARCH FACILITY TYNDALL AFB FL DETACHMENT 1 (ADIC)

(U) Evaluation of an Impulse Testing Technique for  
 Nondestructive Testing of Pavements

DESCRIPTIVE NOTE. Final technical rept 18 Oct 76-10 Jul 77.

PERSONAL AUTHORS: Nielsen, John P ; Baird, Glenn T .  
 REPORT NO. CERF-AP-28

CONTRACT NO. F29601-76-C-0015

MONITOR: CEDDO

TR-77-46

SEP 77 32P DESCRIPTIVE NOTE: Final rept. 1 Jul 76-1 Jan 77.

APR 77 16SP PERSONAL AUTHORS: Gingerman, Dorothy J ; Nangen, Lawrence E.

REPORT NO. CEDDO-TR-78-33

PROJECT NO. 1800

TASK NO. 8A

## UNCLASSIFIED REPORT

ABSTRACT: (U) This report documents the results of a study concerned with the evaluation of a proposed technique to perform nondestructive load evaluations of airfield pavements. This technique consists of determining the speed of propagation of the phase velocities through the various layers of a pavement system. A research plan to further develop the technique is also recommended. This plan contains statements of work, equipment requirements, proposed budget, and a schedule. (Author)

DESCRIPTORS: (U) \*Runways, \*Impulse loading, Wave propagation, Accelerometers, Concrete, Asphalt, Pavements, Vibration, Elastic properties, Field tests, Data reduction, Fourier transformation, Vans, Air transportable equipment, Vibrators (Mechanical), Structural response

ABSTRACT (U) The Air Force contracted with Argonne National Laboratory to develop a series of computer programs to assess the air quality impact of Air Force operations. These programs are called the Air Quality Assessment Model (AQAM). The AQAM contains three computer codes: (A) source emission inventory to quantify the hundreds of sources typically found on an airbase; a short term emission/dispersion model to make hourly air quality predictions; and a long term emission/dispersion model to make monthly or annual predictions. This report documents only the source emissions inventory computer code. While aircraft are emphasized, ground vehicles, space heating, and industrial sources can also be handled. Flow charts, listings, and brief descriptions of each subroutine are presented in this report. It is intended for readers with a computer programming background who wish to examine or alter the computer codes (Author)

DESCRIPTORS: (U) \*Aircraft, \*Computer programs, \*Assessment, \*Emission control, \*Machine coding

IDENTIFIERS (U) AQAM(Air Quality Assessment Model), MCEFD019005A03, PES2017, Quality Assessment Model, MCEFD019005A03, PES2017

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SEARCH CONTROL NO 035028

AD-A045 807 13/2  
CONTINUED

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DRAFTMENT 1 (ADIC)

(U) A Theory on Water Filtration Part II Node I

Presentation

Final rept 1 Jun 73-31 Dec 78.

JUN 77 25P

PERSONAL AUTHORS Shelton, Stephen P.

REPORT NO CEDO-TR-77-2

PROJECT NO 2103

TASK NO. 6W

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Part 3. AD-A043 290

ABSTRACT: (U) The specific objective of this investigation was to apply existing theoretical concepts used in aerosol mechanics to various water filtration systems. Once developed, these equations were used to describe the water filtration processes of concern as a function of the characteristics of the fluid, suspended particles, and filter media. It was concluded that the proposed model had the potential to predict the relationship between flow, pressure, time, and efficiency for the data evaluated. In addition, the model was found to have advantages over current water filtration models since, unlike current models, it considers raw water quality and predicts filtration efficiency (Author)

DESCRIPTION: (U) Water treatment, filtration, water filters, environmental engineering, mathematical models, mathematical prediction, aerosols, diffusion, mass transfer, pressure gradients, drops, water flow, FluxRate, Water Quality, Efficiency, Facilities, Sand, particle size

IDENTIFIERS (U) PEB03723F, NUAFCEC21030M45

IAC NO PL-901135

IAC DOCUMENT TYPE PLASTC - MICROFICHE

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AD-A045 607

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DTIC REPORT BIBLIOGRAPHY

AD-A045 484 13/2 21/2 1/3 AD-A045 483 13/2

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADTC)

(U) Air Quality Impact of Aircraft at 10 USAF Bases

DESCRIPTIVE NOTE: Final rept 25 Sep 78-15 Mar 77.

APR 77 17P

PERSONAL AUTHORS: Maugler, Dennis F.; Gross, Bradford C.;  
III, Dailey, Peter S.

REPORT NO. CEDO-TR-78-23

UNCLASSIFIED REPORT

ABSTRACT: (U) The contributions of Air Force aircraft to ambient air quality at 10 major bases were predicted from operational data using a computerized Gaussian dispersion technique. Annual arithmetic mean concentrations are presented for common air pollutants. The predictions are well below National Ambient Air Quality Standards for those pollutants with standards specified as annual averages. Hourly worst case predictions were converted to Pollutant Standards Index (PSI) values. Aircraft sources produced average PSI values of 4.9 for nitrogen dioxide, 2.1 carbon monoxide, 1.9 for total suspended particulates, and 1.4 for sulfur dioxide. The PSI scale ranges from 0 to 100 with 100 designated as the level above which health effects may occur. A PSI for hydrocarbons could not be computed since direct health effects have not been observed and indirect effects through oxidant formation could not be predicted within the scope of this analysis. The relative significance of pollutants emitted by AF aircraft indicated by this report is (from most significant to least significant): hydrocarbons, oxides of nitrogen, particulate matter, carbon monoxide, and sulfur dioxide. This ordering can be used as a guide to future engine design priorities and control strategy development.

DESCRIPTORS: (U) Air quality, Aircraft engines, Exhaust gases, Emission, Air pollution, Turbojet engines, Computerized simulation, Air force facilities, Meteorological data, Standards, Environmental protection, Mathematical prediction, Dispersion, Pollutants

UNCLASSIFIED

SEARCH CONTROL NO 055028

AD-A045 483

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FL DETACHMENT 1 (ADTC)

(U) Water Quality Assessment Model - Oxygen Dynamics Model  
for Low-Flow Streams

DESCRIPTIVE NOTE: Final rept 1 Jul 76-1 Mar 77.

MAR '77 32P

PERSONAL AUTHORS: Shelton, Stephen P.

REPORT NO. CEDO-1R-77-16

PROJECT NO 1900

UNCLASSIFIED REPORT

ABSTRACT: (U) This investigation was undertaken to develop a low flow stream use assimilation model to determine the effect of point source discharges at selected Air Force installations. The impetus for this study was the lack of available low-flow stream models and the AF need to evaluate low-flow streams that traverse their installations. From data acquired by this previous investigations, an analysis of oxygen sinks and sources, units in their level of significance for low-flow streams, units taken. Oxygen sources and sinks considered were: carbonaceous BOD, nitrogenous BOD, stream reaeration, benthic oxygen demand, and photosynthesis/ respiration. In addition to these, the effects of toxic pollutants upon biological reaction rates and waste assimilative capacity were also explored. Techniques employed in this investigation may be considered as one approach to determine waste assimilation capacity and to simulate variations in the oxygen profile caused by point source wastewater discharges into low flow stream. The validity and limitations of the overall approach, the ability to extrapolate oxygen profiles, and the ability to transpose conditions to facilitate prediction of future conditions is, at this time, not fully substantiated; however, positive indications have been obtained in model verification that lend credence to the procedures adopted for the proposed model and sensitivity analysis to derive confidence intervals (Author)

ABSTRACT: (U) This investigation was undertaken to determine the effect of point source discharges at selected Air Force installations. The impetus for this study was the lack of available low-flow stream models and the AF need to evaluate low-flow streams that traverse their installations. From data acquired by this previous investigations, an analysis of oxygen sinks and sources, units in their level of significance for low-flow streams, units taken. Oxygen sources and sinks considered were: carbonaceous BOD, nitrogenous BOD, stream reaeration, benthic oxygen demand, and photosynthesis/ respiration. In addition to these, the effects of toxic pollutants upon biological reaction rates and waste assimilative capacity were also explored. Techniques employed in this investigation may be considered as one approach to determine waste assimilation capacity and to simulate variations in the oxygen profile caused by point source wastewater discharges into low flow stream. The validity and limitations of the overall approach, the ability to extrapolate oxygen profiles, and the ability to transpose conditions to facilitate prediction of future conditions is, at this time, not fully substantiated; however, positive indications have been obtained in model verification that lend credence to the procedures adopted for the proposed model and sensitivity analysis to derive confidence intervals (Author)

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AD-A045 397 13/2 13/11 12/1  
CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
FYNDAHL, AFB FL DETACHMENT 1 (ADTC)  
(U) A Theory on Water Filtration, Part I Background  
DESCRITIVE NOTE Final rept 1 Jun 73-31 Disc 78.  
JAN 77 42P  
PERSONAL AUTHORS Shelton, Stephen P  
REPORT NO CEEEDO-TR-77-1  
PROJECT NO 2103  
TASK NO 6W

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Part 3, AD-A043 280

ABSTRACT (U) The specific objective of this investigation was to apply existing theoretical concepts used in aerosol mechanics to various water filtration systems. Once developed, these equations were used to describe the water filtration processes of concern as a function of the characteristics of the fluid, suspended particles, and filter media. It was concluded that the proposed model had the potential to predict the relationship between flow, pressure, time, and efficiency for the data evaluated. In addition, the model was found to have advantages over current water filtration models since, unlike current models, it considers raw water quality and predicts filtration efficiency. (Author)

DESCRIPTIONS (U) Water filters, filtration, mathematical models, conceptual formation, experimental design, aerosols, fluid mechanics, media, particle size, colloids, flow rate, pressure, air filters, water pollution abatement, environmental engineering, mass transfer, diffusion theory

IDENTIFIERS (U) PEE83723F, WUEED002103BN45  
IAC NO PL-901163

IAC DOCUMENT TYPE PLASTIC - MICROFICHE --

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AD-A045 387 CONTINUUM

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A045 045 13/2  
CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TINDALL AFB FE RETACHMENT 1 (ADIC)  
(U) An Investigation of the Effects of Density, Size and  
Shape Upon the Air Classification of Municipal Type  
Solid Waste

DESCRIPTIVE NOTE: Filter Rep?

JAN 77 1672

PERSONAL AUTHOR(S) Sweeney, Patrick J. :

REPORT NO CECDO-TR-77-26

PROJECT NO 2103

TASK NO AW

UNCLASSIFIED REPORT

ABSTRACT (U) The objective of this research was to determine the feasibility of separating municipal solid waste type materials into more than two fractions by passing the material through a vertical air classifier. This feasibility was demonstrated by suspending specimens of varying densities, sizes, and shapes in a vertical air classifier and noting the terminal velocities of the materials. Since most shredded solid waste approximates flat plates of varying sizes and shapes, flat plates of six different materials in aspect ratios (length over width) from one to four and in four different sizes from 0.025 to 0.000 square inches (0.4032 to 0.0510 square centimeters) were evaluated to determine terminal velocity. The material studied included stone, aluminum, bass wood, cardboard, paper, cloth, and glass. The theoretical development, the experimental results, and the analysis of variance statistical tests indicate that municipal solid waste type material does exhibit a difference in terminal velocity as a function mostly of density and only slightly of the size and shape parameters tested. This indicates that municipal solid waste may be separable into several fractions provided the proper air classification equipment is used (author)

DESCRIPTORS (U)

\*Solid wastes, \*Waste management, \*Urban areas, Air, Separation, Density, Size(Dimensions), Shape, Classification, Resources,

AD-A045 387

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AD-A045 045 CONTINUED

Recovery, Steel, Aluminum, Wood, Paper, Paperboard, Glass, Fabrics, Shredding, Vacuosity  
IDENTIFIERS: (U) \*Air classification systems. PEG3723R.  
WAFCEC2103EW2. LPM-AFUKC-77-058

TRANK J SELLER RESEARCH LAB UNITED STATES AIR FORCE  
ACADEMY COLOR  
House

(U) Second Interim Technical Report on USAFA Solar Test

DESCRITIVE NOTE Rept. for May 76-Apr 77.

SEP 77 185P

PERSONAL AUTHORS: Egan, Anthony; Trank, John T.

REPORT NO FUSRL-TR-77-0018

PROJECT NO 2303, 2054

TASK NO F1, 50

MONITOR CEEPO  
TR-77-34

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Original contains color plates. All DDC reproductions will be in black and white. See also Rep. no FUSRL-TR-76-0008. AD-A030 843

ABSTRACT: (U) This report describes the continuing performance of the first retrofitted, solar-heated facility in the USAF. The Solar Test House at the USAFA The attempts at improving the performance of the system have centered on the following: additional heat exchangers, bleed air line and valves, ground array array changes, reduced volume of storage tank, control temperature reductions, flow rate reductions, new data gathering system. The Solar Test House was used to conserve thermal energy by using urea foam insulation in the ceilings, vestibules on the doors, and linear diffusers for the duct outlets. Thermography studies have been started to explore the flow patterns through the solar arrays and correlate pictures with multiplexed sensor readings. Daily, monthly, and yearly data analysis is reported to show the effects of the various system and operational changes and the improved performances (Author)

SCRIPTORS (U) Solar heating, Heating/cooling, Solar  
\*Air Force facilities, Solar panels, Refracting, Solar

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AD-A045 045

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## DTIC REPORT BIBLIOGRAPHY

AD-A045 042 CONTINUED

energy. Energy conservation. Thermography. Performance (power/no. Heat exchangers. Bleed system. Arrests. Storage tanks. Flow rate. Thermal insulation. IDENTIFIERS: (U) REF ID: 3005176. PEB1102F. MUJ-URL23545005. PEB4708F

SEARCH CONTROL NO 055028

AD-A043 288 13/2 13/8

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FLA DETACHMENT 1 (ADTC)

(U) Pollutant Generation by Air Force Electropolishing  
Processes

DESCRIPTIVE NOTE: Final rept 1 Oct 74-1 Sep 76.

JUN 77 37P

PERSONAL AUTHORS: Daisy, Peter S. ;

REPORT NO CEDO-TR-77-10

PROJECT NO 2103

TASK NO 1A

## UNCLASSIFIED REPORT

ABSTRACT: (U) A detailed study of the pollutants generated in Air Force electropolishing was performed and pollution emission factors were recommended for a variety of electropolishing operations. The largest single source of pollution in the plating operations is thought to be material removed by parts when they are withdrawn from the solution and rinsed. For chromium plating, a significant amount of solution was removed to 0.12 g/l da. This number was independent of a wide variety of electropolishing variables and is recommended as an emission factor in chromium electropolishing. Aerosol generation was not important in nickel, cadmium, or silver plating processes. Cyanide, emissions in cadmium plating were independent of workload and depended primarily on tank surface area. An emission factor of 10 g/sq m da is recommended. Cullitferal studies of scrubber efficiency for scrubber collection of chromium aerosols, quantitatively, the droplet problem, and potential savings through chromium overplate recovery are presented. Chromium is identified as the major pollution problem resulting from electropolishing. Logic is presented that could lead to the exemption of Air Force electropolishing operations from federal electropolishing emission standards. (Author)

DESCRIPTORS (U) "Electropolishing", "Air pollution", "Water pollution", "Chromium", "Nickel", "Silver", "Cadmium", "Cyanides", "Aerosols", "Scrubber", "Effluents

AD-A045 042

AD-A043 288

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AD-AD43 268 **CONTINUED** DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055026  
 IDENTIFIERS: (U) PEG3723F, WUAFCE22:031A15 SEARCH CONTROL NO 055026  
 CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
 TYNDALE AFB FLA DETACHMENT 1 (ADTC)

(U) A New Concept in Sludge Filtration Theory for Air  
 Force Industrial Processes

DESCRIPTIVE NOTE: Final rept 1 Jan-30 Jun '74.

JUN 77 17P

PERSONAL AUTHORS: Shellion, Stephen P.

REPORT NO: CEDO-TR-77-29

PROJECT NO: 2103

## UNCLASSIFIED REPORT

Availability: Microfiche copies only

ABSTRACT: (U) The specific objective of this investigation was to apply existing theoretical concepts used in air filtration to various sludge filtration systems used in Air Force industrial processes. This objective involved development of a consistent theoretical concept applicable to a wide range of water filtration systems. Once developed, these equations were used to describe the sludge filtration process of concern to the Air Force as a function of the basic system parameters rather than using the classical empirical data base (Author)

DESCRIPTORS: (U) Sludge, Filtration, Air Force facilities, Industrial engineering, Theory, Vacuums, apparatus, Air filters, Water treatment, Water filters, Aerosols, Filters, Waste disposal, Water, Removal, Dry materials, Mixture content, Particles, Concentration(chemistry), Mathematical models

IDENTIFIERS: (U) Sludge filtration, Deuterating Suspended particulates, LPN-ADTC-2103BN45, PEG3723F

AD-AD43 268

AD-AD43 081

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A042 003 13/2 NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL ENGINEERING RESEARCH FACILITY

(U) Pavement Evaluation System

DESCRIPTIVE NOTE: Final rept. 1 Dec 75-30 Sep 76.

OCT 76 108P PERSONAL AUTHORS: Nielsen, John P., Laird, Glenn T.

REPORT NO CRRF-A-20

CONTRACT NO. F28501-76-C-0015

MONITOR: AFCFC TR-76-8

SEARCH CONTROL NO 055028

AD-A042 028 13/3 14/1 CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN ILL

(U) Construction Costs of Air Force and Army Facilities and Construction of a Cost Prediction Model

DESCRIPTIVE NOTE: Final rept. 1 Jul 76-30 Oct 76.

JUL 77 71P PERSONAL AUTHORS: Hahlin, Christopher

REPORT NO CERL-TR-A-224

PROJECT NO 4A76271BAT41

TASK NO T7

MONITOR: AFSEC

52

UNCLASSIFIED REPORT

**ABSTRACT.** (U) This report describes the current (1978) Air Force method for load evaluation of airfield pavements. The technique makes use of wave-propagation data and finite-element computer codes to determine the load capacity of pavements. The computer code also provides an estimate of the remaining service life of the pavement from failure criteria for the various layers of the pavement. (Author)

**DESCRIPTORS:** (U) Pavements, Standing fields, Load (Forces), Life expectancy, Nondestructive testing, Wave propagation, Finite element analysis, Safety, Stress, Shear, Strength, Strain relations, Moduli, Shear stresses, Shear strength, Mechanical properties, Structural properties, Test methods

AC NO: NT-015028 AC DOCUMENT TYPE: NTIAC - MICROFICHE -

AC SUBJECT TERMS: N-(U)PAVEMENTS, AIRPORTS, FINITE ELEMENTS, LOADS (FORCES), LIFE (DURABILITY), WAVE PROPAGATION, ELEMENT ANALYSIS, SAFETY, STRESS STRAIN RELATIONS, STRENGTHS, FAILURE CRITERIA, TEST METHODS, STRUCTURAL ANALYSIS, STRUCTURES, PROPERTIES, STRAIN (MECHANICS).

ABSTRACT. (U) The recility maintenance organizations of several Air Force and Army installations were analyzed to determine the percentage of their direct maintenance repair or replacement efforts that were corrosion-related. Also included were the costs of designing and inspecting corrosion-related construction projects. This raw data was processed and correlated with climatological, geographic and environmental statistics to develop a predictive corrosion cost model. The resulting empirical equations are able to predict facility corrosion costs and classification with reasonable accuracy as a function of installation dimensions and capacities, and readily obtainable weather, soil and air quality data. (Author)

DESCRIPTORS: (U) Construction materials, Corrosion, Cost analysis, Mathematical models, Air Force facilities, Army, Military facilities, Soils, Costs, Construction, Electrical conductivity, Air pollution, Energy consumption, Climate, Topography, Predictions, Water pollution

IDENTIFIERS (U) MU001, AST41, PEB2719A

411-10043 003

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AD-A042 823  
 International Airports, District of Columbia, Computer programs, Equations of motion, Weight, Programming, NASA is, User needs, FORTAN, Tables(Data), Computer printouts

AD-A042 823  
 International airports, District of Columbia, Computer programs, Equations of motion, Weight, Programming, NASA is, User needs, FORTAN, Tables(Data), Computer printouts

(U) Collection of Commercial Aircraft Characteristics for Study of Runway Roughness

IDENTIFIERS (U) TAXI computer program

DESCRIPTIVE NOTE: Final rept.

MAY 77 130P

PERSONAL AUTHORS Gerard, Anthony C.

REPORT NO AFCEC-TR-75-23

CONTRACT NO DOT-F-473(WA1-361

MONITOR: FAA-HD  
 78-64

## UNCLASSIFIED REPORT

653

Availability. Microfiche copies only

ABSTRACT (U) Engineering data compatible with 'TAXI' computer program was collected for six commercial jet aircraft, the Boeing 707-320C, 707-200, and 727 and the McDonnell Douglas DC-6-B3, DC-6-40 and the DC-10-10. The data are presented in the same required /TAXI/ format. A simulation was made for each aircraft taking off from two separate airfields, Dulles International Airport in Washington, D.C. and Will Rogers International Airport at Oklahoma City, Oklahoma. Two profiles were used to point out the differences in aircraft response to different runway profiles. The calculated plotted results are presented in the results section of this report. This report also serves as a program users manual. A sample problem simulating a Boeing 707-320C during a constant speed taxi (100 ft/sec) over the profile at the Will Rogers International Airport is included in the report. All FORTAN symbols used in TAXI are defined, and a complete listing of the program is included. An appendix provides airplane data representing a 'typical' wide body tri-jet transport and two simulations using this data

DESCRIPTORS (U) \*Runways, \*Pavements, \*jet transport planes, Surface roughness, Profiles, Dynamic response, Computerized simulation, Commercial aircraft, Aircraft landing, Taxiing, Landing gear, Cray-1 (Computer), Landing fields, Commercial aviation, Oklahoma, Virginia.

AD-A042 823

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SEARCH CONTROL NO 055028

AD-A042 388 13/2

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE  
TYNDALL AFB FLA DETACHMENT 1 (ADTC)

(U) Chemical Coagulation Doseage Control

DESCRIPTIVE NOTE: Final rept 30 Jun 73-1 Jan 76.

DEC 73 27P

PERSONAL AUTHORS: Shelton, Stephen P :

REPORT NO. CEEDO-TR-70-44

PROJECT NO. 2103

AD-042 324 13/13

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

(U) Severely Eccentric Loads on Round Footings

DESCRIPTIVE NOTE: Final rept Sep-Dec 76.

JAN 77 18P

PERSONAL AUTHORS: Morrison, Dennis .

REPORT NO. AFCEC-TR-77-6

PROJECT NO. 2054

TASK NO. 80

## UNCLASSIFIED REPORT

ABSTRACT: (U) The purpose of this investigation was to determine if the best dosage for various coagulants would be the same if a number of indicators were used as the best dosage criteria. Specifically, what is the indicated best coagulant dosage between zeta potential, colloidal filtration, apparent color, COD reduction, turbidity reduction, and bacteriophage reduction. Two types of water were used to empirically determine the above relationships. The first water was a secondary wastewater treatment plant effluent; the type of wastewater that may be delivered to an advanced wastewater treatment system. The other water was a relatively unpolluted raw surface water; the type of surface supply that is often used for a potable water supply. The results of this investigation, after testing with nine different coagulant/coagulant aid combinations, revealed that the best dosage varies as a function of the indicator used to determine that dosage.

DESCRIPTORS: (U) Water treatment, Coagulation, effectiveness, Xanto water, Test methods, Indicators, Colors, Turbidity, Chlorination, Dosage, Quality control, Contamination

IDENTIFIERS: (U) LPN-ADTC-21030445, PEG3723F

ABSTRACT: (U) Design aids for sizing round footings with eccentric loads outside of the middle one-fourth are presented. Equations are developed and shown in graphical form by normalizing the load (author)

DESCRIPTORS: (U) Foundations (Structures), Civil engineering, Soil mechanics, Load forces, Structural mechanics, Circular graphics, Computations, Force/Mechanics, Pressure distribution

IDENTIFIERS: (U) Footings (Structures), Circular structures, Eccentric loads, Round footings, Stressess, MUAFCEC20545007, PEG4708F

## UNCLASSIFIED REPORT

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DTIC REPORT BIBLIOGRAPHY

AD-A042 143 20/1 9/2

BOLT BERANEK AND NEWMAN INC CARDONA PARK CALIF

(U) Community Noise Exposure Resulting from Aircraft Operations NOISEMAP Computer Program Operation Manual Addendum for Version 3.3 of NOISEMAP

DESCRIPTIVE NOTE. Rept. for 22 Mar-78 Dec 78.

MAY 77 30P

PERSONAL AUTHORS. Reddingius, Nicolae H.

REPORT NO. 8BN-3469

CONTRACT NO. F088055-76-C-0186

PROJECT NO. 7231

TASK NO. 04

MONITOR. APRIL

TR-73-108-APP-Add-1

UNCLASSIFIED REPORT

Availability. Microfiche copies only

SUPPLEMENTARY NOTE. Appendix I to Appendix dated Feb 78.  
AD-A042 143 See also basic report dated Jul 74. AD-785  
380

ABSTRACT. (U) This report outlines modifications to NOISEMAP 3.2 and a user oriented description of a NOISEMAP data screening program called DATASCREEN. Changes to NOISEMAP include: new identification options for the FILTER, DEPART, and RHOPEAD cards; option to print only those pages from PROPLT, APPLOT, DASCORD, or RHOPEAD cards that contain parts of a contour; option to reduce the number of alignment pages; option to suppress the listings of SEL profiles. Interface with GPS is no longer restricted to a grid spacing of 1000 feet or less, addition of the CLEAR keyword that will exchange all entries in the library. The new program, DATASCREEN, provides an improved summary, improved error diagnostics, and additional graphic outputs. A deck prepared for DATASCREEN will be accepted by NOISEMAP. The purpose of DATASCREEN is to provide the user with an efficient screening program to use in preparing a data deck for AD-A042 143

SEARCH CONTROL NO. 015528

AD-A042 143 CONTINUED

CONTENTS

DESCRIPTORS: (U) Aircraft noise, noise pollution, Computer programming, Programming manuals, Military facilities, Airports, Runways, Algorithms, Input output processing, Executive routines.

IDENTIFIERS: (U) NOISEMAP computer programs.

WNAIRL72310428. PED202F

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NATIONAL 'REAU OF STANDARDS	WASHINGTON D C	SAN DIEGO STATE UNIV CALIF CENTER FOR REGIONAL ENVIRONMENTAL STUDIES	6/8
(U) An	ch for Managing an Energy Conservation	(U) Ecological Assessment of Vandenberg Air Force Base, California Volume III Environmental Planning System	9/2
PROG	Final rept	Final rept Jun 75-Aug 76.	
REPORT NO	60P	DESCRIPTIVE NOTE	
JAN 77	NBSIR-77-1204	SEP 78	107P
MONITOR		PERSNL. AUTHRS	Reilly, Richard M .Stutz, Frederick P ;
AFCCC			Cooper, Charles F ;
X			

HAWAII REPORT

**SUPPLEMENTARY NOTE.** See also Rept. no **MSIR-77-1238**.  
**ASSEC-YD-77-12**

**ABSTRACT:** (1) General and specific guidelines to be followed by USAF management personnel have been developed and tabulated in this report. These guidelines include, for example, establishing management structures to implement the detailed energy conservation programs, analyzing alternative energy conservation options for analyzing alternative energy conservation options for most of the Air Force Base facilities, family housing units, and special buildings, and implementing short- and long-range plans for establishing and implementing energy management, personnel, and monitoring program.

**DESCRIPTIONS.** (U) •Energy conservation, \*Energy management, \*Energy consumption, Buildings, Facilities, Military facilities, Air Force facilities, Surveys, Natural resources

with the computerized data base developed upon the complete description of the quantitative ecological data base upon which the EPS operates is provided. A series of case studies show how to apply the EPS to VAB. An evaluation of manual and automated methods for determining areas of vegetation is presented using statistical tests to compare the various methods. Complete documentation is given for all computer programs used in the EPS (author).

DESCRIPTORS (U) • Ecology, • Natural resources, • Air

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## UNCLASSIFIED

DTIC REPORT CITROGRAPHY

AD-A040 482 CONTINUED

Force facilities, Environmental management, Surveys, Computer graphics, Computer programs, Sampling, Computer printouts, Civil engineering, Environmental impact statements, Planning, Trees, Shrubs, Vegetation, California

IDENTIFIERS: (U) Vandenberg Air Force Base,  
MFARCEC21033E24, PEO3723F

SEARCH CONTROL NO 055028

AD-A040 168 8/8 8/10

NEW ENGLAND AQUARIUM BOSTON MASS

(U) Influence of the Sediment/Water Interface on the Aquatic Chemistry of Heavy Metals

DESCRIPTIVE NOTE. Final rept Feb-Sep 75.

JUN 78 SUP

PERSONAL AUTHORS: Gilbert, Thomas R ;Clay, Alice M ;  
Leighty, David A

CONTRACT NO F28501-75-C-0082

PROJECT NO 2103

MONITOR: AFCEC  
TR-78-22

## UNCLASSIFIED REPORT

ABSTRACT. (U) The mechanisms controlling the transport of three heavy metals: cadmium, chromium, and silver, in natural water systems are evaluated following a review of the scientific literature and laboratory studies of adsorption/desorption behavior and the interaction of these metals with phytoplankton and the water. Chromium as chromata is not appreciably taken up by model inorganic or organic particulates, but after reduction to Cr(II) is rapidly and irreversibly taken up by clay particles. Hydrous iron oxide and phytoplankton Cadmium and silver are more reversibly adsorbed by clay particles, are strongly adsorbed by hydrous manganese oxide, and are concentrated by phytoplankton. Once a part of reducing bottom sediments, the availability of all three metals to the aqueous phase is further reduced so that they are not released by short term resuspension. With prolonged resuspension of a toxic sediment some cadmium may redissolve, but chromium and silver will remain in the solid phase. (Author)

DESCRIPTORS (U) Water chemistry, Heavy metals, Trace elements, Chromium, Cadmium, Silver, Fresh water, Sea water, Sediments, Water, Interfaces, Interactions, Particles, Phytoplankton, Adsorption, Desorption, Clay, Iron oxides, Magnesium oxides, Literature surveys

IDENTIFIERS (U) PE83723F

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 058028

AD-A040 212 1/2

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

(U) Evaluation of Reverse Osmosis for Electroplating  
Wartes

DESCRIPTIVE NOTE Final rept 30 Jun 74-1 Jul 76.

DEC 78 41P

PERSONAL AUTHORS Allen, Dale H. Frain, Emil C.

REPORT NO AFCEC-TR-76-47

PROJECT NO 2103

TASK NO 7W

REPORT DATE 28P

PERSONAL AUTHORS Moerschad, Amrie S. McCracken, Portia R

REPORT NO AFCEC-TR-78-21

PROJECT NO. 2103

TASK NO 3E

## UNCLASSIFIED REPORT

ABSTRACT. (U) The purpose of this research effort was to evaluate Reverse Osmosis (RO) as a process to reduce pollution and increase materials conservation in large Air Force chrome plating operations. In these studies simulated chrome plating solutions were processed by an RO unit built to AFM-1000 specifications by Envirok, Inc. Milwaukee, Wisconsin, using three types of commercial RO modules. In particular, this study was aimed at determining the degree of separation and never any damage/deterioration when RO is applied to hexavalent chromic acid in an acidic medium. (CH<sub>3</sub>O)<sub>2</sub>SO<sub>4</sub> Initial tests were made on a tubular, spiral wound, and permeate (manufactured by a different company to determine which type membrane might be applicable to the chrome waste stream. Based on these initial studies, the Permeate membrane was chosen for further study. The Permeate membrane demonstrated a high salt rejection rate (0.96 to 0.99 reject ratio) and a high product recovery rate (0.69 to 0.70 recovery ratio). A closed system resulting in zero discharge of chromic acid from water emissions was designed based on the results of the permeate membrane. (Author)

DESCRIPTORS (U) \*Reverse osmosis, \*Water pollution, \*Electroplating, Pollution Abatement, \*Membrane, \*Chromic acid, Waste treatment, Waste management, Waste recycling, Recycled materials

IDENTIFIERS (U) Permeate membrane, WUAFCEC21037K37

AD-A040 213

## UNCLASSIFIED

SEARCH CONTROL NO 058028

AD-A040 212 1/2

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

(U) A Review of Publications on the Bird/Aircraft Strike Hazard.

DESCRIPTIVE NOTE Final rept Oct 76-30 Jun 78.

JUL 78

PERSONAL AUTHORS Moorehead, Amrie S. McCracken, Portia R

REPORT NO AFCEC-TR-78-21

PROJECT NO. 2103

TASK NO 3E

## UNCLASSIFIED REPORT

ABSTRACT: (U) The annual cost to the United States Air Force (USAF) to replace or repair aircraft damaged by bird/aircraft collisions has led to an intensive study of the problems associated with birds or aircrafts and in the enroute environment. Since 1980 an active program has been in effect, first at the Air Force Weapons Laboratory (AFWL) at Kirtland Air Force Base, New Mexico, and in 1975 at the Air Force Civil Engineering Center (AFCEC), Tyndall Air Force Base, Florida. This report reviews these Technical Notes (TNs) and Technical Reports (TRs) that have been published as a result of the program effort. (Author)

DESCRIPTORS (U) \*Bird strikes, \*Aviation safety, Review, Aviation accidents, Damage assessment, Aircraft maintenance, Cost analysis

IDENTIFIERS (U) WUAFCEC21033E09, PEG3723F

AD-A040 217  
UNCLASSIFIED  
PAGE 423 055028

## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

AD-A040 113	5/1	13/2	LITTLE (AKHARD) INC	CAMBRIDGE MASS
(U) A Methodology for Preparing Environmental Assessments				
DESCRIPTIVE NOTE Final rept Mar 70-Nov 78.				
NOV 78	4IP			
PERSONAL AUTHORS	Hallstrom, David I			
CONTRACT NO	F28601-74-D-0027			
PROJECT NO	2103			
TASK NO	3E			
AGENCY/ATOR	AFCERC			
	TR-78-9			

## UNCLASSIFIED REPORT

**ABSTRACT.** (U) This report provides instructions for Air Force field personnel in the methods for preparing Environmental Assessments. The report covers the following areas: (1) The necessity of environmental assessments, including a discussion of the applicable laws; (2) Instruction on how to describe the environment in light of the proposed action; (4) Instruction and guidance on approaches to be used when assessing impacts; (3) Establishing and maintaining an environmental baseline data information system. The report is written for a person with a technical background but without experience in environmental analysis. It provides how-to-do-it guidance for field personnel who are assigned the responsibility of preparing environmental assessments.

**DESCRIPTORS.** (U) Environmental management, Resource management, Federal law, Environmental impact statements, Assessment, Mater resources, Land use, Air quality, Water quality, Information systems

**IDENTIFIERS** (U) PEG3723F, MUAFCC21033E25

AD-A040 113

UNCLASSIFIED

## SEARCH CONTROL NO 055028

AD-A039 844

14/2 13/2

NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL ENGINEERING RESEARCH FACILITY

(U) Development of High Pressure Liquid Chromatographic Techniques

DESCRIPTIVE NOTE Final rept 1 Dec 76-30 Jun 78.

OCT 78 88P

PERSONAL AUTHORS: Caton, Roy D., Jr., Matthews, James R., Waters, Edward A.

REPORT NO CTRF-EE-10

CONTRACT NO F28601-76-C-0015

MONITOR: AFCERC

TR-76-23

## UNCLASSIFIED REPORT

**ABSTRACT.** (U) Development of high pressure liquid chromatography detectors is discussed. Preliminary evaluation of a beta-induced luminescence detector employing a tritium source and operated in a luminescence quenching mode is presented. An ultrasonic velocity detector is described, along with calibration date, complete construction details, and operating instructions. A solid-state electrode for silver ion detection using a Andbra04 pellet is described, and calibration date and interference studies are presented. Construction of a beta-induced luminescence detector to be operated in direct luminescence mode is described. Data for the recovery and preliminary characterization of refractory organics from treated wastewater using an organics-carbon sulfide detector are presented. The carbon chloroform extract of the minisampler is analyzed using high pressure liquid chromatography, and column parameters providing maximum resolution of components are given in detail. (Author)

**DESCRIPTORS.** (U) Detectors, Liquid chromatography, Water analysis, Waste water, Waste treatment, Refractory materials, Organic compounds, High pressure luminescence, Tritium, Activated carbon, Ultrasonics, Calibration, Solid-state electronics, Electrodes, Silver compounds, Effluents

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OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 015028

AD-A039 229 13/2 AD A038 731 13/13

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA AIR FORCE CIVIL ENGINEER, NO CENTER TYNDALL AFB FLA

(U) Treatment of N-Nitroodimethylamine Contaminated Waste (U) Air Transportable Shelters. Estimating the 1985 USAF Requirements.

DESCRIPTIVE NOTE Final rept Jun-Dec 78. DESCRIPTIVE NOTE Final rept Jan-Jun 78.

JUL 78 1BP OCT 78 72P

PERSONAL AUTHORS MacNaughton, Michael Q ; Stauffer, Thomas B. PERSONAL AUTHORS Van Orman, James R

REPORT NO AFCEC-TR-78-32 REPORT NO AFCEC-TR-78-24

PROJECT NO. 2103 PROJECT NO. 2101, 2002

TASK NO. 7C UNCLASSIFIED REPORT

ABSTRACT: (U) Air transportable shelters are vital elements in present USAF weapon systems, but standardization is needed. In 1975 a Joint Committee on Tactical Shelters (JOCOTAS) was established by DOD to effect this standardization. This report summarizes the USAF effort in this regard. Configuration requirements are analyzed in four major areas: transportation, natural environment, threat-imposed environment, and special mission considerations.

DESCRIPTORS: (U) Portable Shelters, Military requirements, Air transportable equipment, Tactical warfare, Mobility, Military equipment, Field conditions, Adverse conditions.

IDENTIFIERS: (U) PE62204F, PE63723F

ABSTRACT: (U) Research on the activated carbon removal of N-nitroodimethylamine (NDMA) from caustic waste solutions generated during the manufacture of USAF missile fuel is reported. Results indicate that activated carbon will remove NDMA from the caustic solutions without neutralization and then commercial activated carbons will have approximately the same capacities. Although this process is capable of reducing the NDMA concentration in the waste solutions, disposal of the contaminated carbon still remains a problem. (Author)

DESCRIPTORS: (U) "Waste treatment, Activated carbon, Adsorbents, Liquid rocket propellants, Adsorption, pH factor

IDENTIFIERS: (U) Unsymmetrical dimethyl hydrazine, Nitro-sodimethylamine, PE63723F, WAFCCE2 1037C39

UNCLASSIFIED

11/17: REPORT BIBLIOGRAPHY

AD-A038 858 21/9 1 13/2  
AIR FORCE CIVIL ENGINEERING CENTER TITAN II AFD FLA  
(U) **MORI TREATABILITY STUDIES**  
DESCRIPTIVE NOTE Final rept 1 Jun-1 Oct 75.  
DEC 78 13D  
PERSONAL AUTHORS Spolton, Stephen P.  
REPORT NO AFCEC-TR-78-43  
PROJECT NO 2103  
TASK NO 7C

UNCLASSIFIED REPORT

ABSTRACT (U) This investigation evaluated the feasibility of destruction of NOFA using the wet air oxidation process. From the limited data evaluated, it was determined that NOFA was amenable to destruction by wet air oxidation to approximately the 1.0 mg/l level with no active ease. Reaction below the 1.0 mg/l level appears possible; however, the research required to determine the operational conditions to achieve oxidation to these levels was beyond the scope of this investigation. (Author)

DESCRIPTIONS (U) Amine compounds, Waste recycling, Oxidation, Chemical derivatives, Diethyl hydrazine (1-1) Liquid rocket fuels, Caustics, Ketas (Inksterite), Carboxylic acids, Derivatives, Amides, Solvent hydroxide, Nitrites, Passability studies, Sampling, Waste treatment, Experimental data

IDENTIFIERS (U) Sodium Nitrosodimethylamine, H-nitrosodimethylamine(NODA), Amine/nitrosodimethyl Wet air oxidation process, UDMH(unimolecular) 1,1-diaminodimethylhydrazine, WAFCEC21037C55, PC03723F

SEARCH CONTROL NO 056028

AD A038 848 1/5 8/13 19/4  
AIR FORCE CIVIL ENGINEERING CENTER TITAN II AFD FLA  
(U) **AF-2 Base Course Requirements on Bobris Subgrades**  
SCRIPTIVE NOTE Final rep; May Aug 78.

DEC 78 24P  
PERSONAL AUTHORS Rollings, Raymond S.  
REPORT NO AFCEC-TR-78-45

UNCLASSIFIED REPORT

ABSTRACT (U) Existing data were used to examine the types of soils and their thicknesses that can be used as a select fill base course with AF-2 in the existing aircraft bomb damage repair procedures. Dense graded, cohesionless crushed aggregate is the preferred material for the select fill base courses. Sand and naturally occurring well-graded gravels are suitable alternatives. Thickness of the base course will vary from 12 to 24 inches depending on the backfill soil type and moisture content. (Author)

DESCRIPTIONS (U) Landing mats, cratering, backfills, Bomb damage, Civil engineering, Bobris, Soil mechanics, Repair, Thickness, Soil classification  
IDENTIFIERS (U) Fill base, AF-2 landing mats, Aggregates, PEB3723F

## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A037 892

1372

## AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

(U) Prediction of Test Cell Visibility Emissions  
 DESCRIPTIVE NOTE Final rept Jun-Nov 78.

DEC 78

41P

PERSONAL AUTHORS Finch, Samuel P., IEEE/1, Arland W.

Jr.

REPORT NO AFCEC-TR-78-47

PROJECT NO 2103

TASK NO 7A

UNCLASSIFIED REPORT

ABSTRACT. (U) A theoretical correlation between jet engine test cell plume opacity and Society of Automotive Engineers (SAE) engine smoke number (SN) was developed. Intermediate results provide spot loading at the exhaust plane of the engine, engine exhaust flow rates and test cell total air flow rate. The specific particle extinction coefficient which correlates light scattering properties with spot loading is the most difficult parameter to define. A valuable predictor from Mie theory is used for corrections close to the exhaust plane of the engine. At the exit plane of the exhaust stack, agglomeration and coagulation change the particle size distribution and individual particle density so that theoretical prediction is difficult. The value for the specific particle extinction coefficient at the exhaust stack was chosen based on what little empirical data was available. When additional data becomes available, it should be possible to define this parameter more precisely. (Author)

DESCRIPTORS. (U) \*Int on the exhaust \*Air pollution, Exhaust plumes, Environmental protection, Particulates, Socy. Automobile exhaust, Predictions, Smoke

IDENTIFIERS (U) WUAFCEC21037A29, PE083723F

AD-A037 894

## UNCLASSIFIED

SEARCH CONTROL NO 055028

AD-A037 892

1372

## AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

(U) Methodology for Air Force Optimization of Solid Waste Management

DESCRIPTIVE NOTE Final rept.

SEP 78

88P

PERSONAL AUTHORS Ollendorf, Robert F.

REPORT NO AFCEC-TR-78-20

PROJECT NO 2103

TASK NO 8H

UNCLASSIFIED REPORT

662

ABSTRACT. (U) This report summarizes a methodology for optimizing solid waste management at Air Force installations. The method (DGY) was originally developed by contract and applied to four Air Force bases. The purpose of this report is to provide a logical and readily accessible source of guidance for Air Force base managers who need to reevaluate their solid waste management programs because of increased cost and environmental pressures. (Author)

DESCRIPTORS. (U) \*Waste management, \*Solid wastes, \*Air Force facilities, \*Methodology, \*Waste disposal, \*Optimization, \*Cost effectiveness, \*Sanitary engineering, \*Systems analysis

IDENTIFIERS (U) WUAFCEC21036N09, PE083723F

AD-A037 892

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AD-A037 892

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AD-A037 894

## UNCLASSIFIED

DTIC REPORT 818100/APHY

AD-A037 476 13-2 774

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA.

(U) Evaluation of Activated Carbon for Fuel Oil Adsorption from a Potable Water Supply

DESCRIPTIVE NOTE Final rept Mar 75-May 76.

OCT 76

12P

PERSONAL AUTHORS Allen, Dale H.

REPORT NO AFCEC-TR-76-48

PROJECT NO 2103

TASK NO 7N

## UNCLASSIFIED REPORT

ABSTRACT (U) Evaluation of activated carbon adsorption process to remove diesel fuel from a contaminated Air Force Water supply was accomplished. Laboratory scale tests proved activated carbon highly capable of removing diesel fuel from water. Determinations of adsorption zone, contact time, and other operating parameters were unsuccessful because of extreme rapidity of adsorption by the activated carbon. (Author)

DESCRIPTORS (U) Activated carbon, Adsorption, Diesel fuels, Potable water, Oil pollution, Decontamination, Water supplies

IDENTIFIERS (U) AFCEC21037457, PEE8725F

SEARCH CONTROL NO 055026

AD-A038 544 1/5 11/2

NEW MEXICO CITY ALBUQUERQUE ERIC H WING CIVIL ENGINEERING RESEARCH FACILITY

(U) Acoustic-Emission Characteristics of Plain Concrete

DESCRIPTIVE NOTE Final rept 1 Mar 75-30 Sep 78.

OCT 78

42P

PERSONAL AUTHORS Griffin, Donald F., Nielsen, John P.

REPORT NO CERT-AR-222

CONTRACT NO F29601-76-C-0015

PROJECT NO 2104

TASK NO 1A

MONITOR AFCEC

TR-76-30

## UNCLASSIFIED REPORT

ABSTRACT (U) The results of acoustic-emission tests on young concrete specimens and concrete cores from airfield pavements indicate that the Kaiser Effect is not permanent in concrete. That is, there is a recovery such that load cycles applied subsequent to the initial load cycle will produce acoustic-emission signals similar to those obtained during the first load cycle. This report suggests, therefore, that the Kaiser Effect cannot be used to detect the maximum part stress in concrete which has not been subjected to a continuous stress. (Author)

DESCRIPTORS (U) Concrete, Runways, Curing, Acoustic measurement, Aging (Materials), Fatigue (Mechanics), Stresses, Recovery

IDENTIFIERS (U) Kaiser effect, PEE8723F, AFCEC21041A4

AD A037 476

AD A038 544

UNCLASSIFIED

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## DTIC REPORT BIBLIOGRAPHY

AD-A038 387

9/2  
NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL  
ENGINEERING RESEARCH FACILITY

(U) Development of Contouring Capability for Displaying  
Results of Air Quality Assessment Model

DESCRIPTIVE NOTE Final rept 1 Jul 78-1 Jun 78.

OCT 78 40P

PERSONAL AUTHORS: Murphy, Edward P.

REPORT NO. CERF-EE-8

CONTRACT NO. F29001-78-C-0015

PROJECT NO. 2103

TASK NO. 84

MONITOR: AFCEC

TR-78-25

## UNCLASSIFIED REPORT

SEARCH CONTROL NO. 085018  
AD-A038 388 12/1  
NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF BIOSTATISTICS  
(U) Asymptotically Distribution-Free Aligned Rank Order  
Tests for Composite Hypotheses for General  
Multivariate Linear Models,  
78 17P

PERSONAL AUTHORS: Sen, Pranab Kumar; Puri, Martin L. ;  
CONTRACT NO. AF AFOSR-2738-74  
PROJECT NO. 2304  
TASK NO. A5  
MONITOR: AFOSR  
TR-77-0104

## UNCLASSIFIED REPORT

ABSTRACT: (U) For General multivariate linear models, a  
composition of hypotheses does not usually induce invariance  
of the joint distribution under appropriate groups of  
transformations, so that genuinely distribution-free  
tests do not usually exist. For this purpose, some  
aligned rank order statistics are incorporated in the  
proposal and study of a class of asymptotically  
distribution-free tests. Tests for the parallelism of  
several multiple regression surfaces are also considered.  
Finally, the optimality properties of these tests are  
discussed. (Author)

DESCRIPTORS: (U) Multivariate analysis, Rank order  
statistics, Statistical tests, Linearity, Mathematical

models, Regression analysis, Hypotheses  
IDENTIFIERS: (U) WAUAFOSR2304A5, REG1102F

664

AD-A038 397

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AD-A038 390

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DTIC REPORT DINTOGRAPHY SEARCH CONTROL NO 058028  
AD-A033 089 13/2 10/3 0/1  
AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA  
(U) Air Force Civil Engineering Center Fiscal Year 1976  
Air Force Technical Objectives Document  
DEC 76 28P  
REPORT NO AFCEC-TR-76-40  
PROJECT NO 2093, 414N  
TASK NO 01  
UNCLASSIFIED REPORT

ABSTRACT. (U) This TDR describes the four Technical Planning Objectives developed to guide the conduct of research and development in passive defense techniques for the theater aircraft, pavement studies, environmental pollution observation and control, air mobility concepts, energy conservation, fire fighting equipment, air base support, and warm fog dispersal. (Author)

DESCRIPTIONS. (U) Civil engineering, Air Force planning, planning programming budgeting, structural pavements, environmental protection, pollution, technology, contracts, shelters, technical objective documents, PH1800, PH2101, PH2102, PH2103, PH2084, PH2080, PH63723P, PH24708P. Technology forecasting, Defense planning

IDENTIFIERS (U) PH2101, PH2102, PH2103, PH2084, PH2080, PH63723P, PH24708P.

DESCRIPTIONS. (U) Dzone Oxidation of Metal Plating Cyanides Wastewater  
DESCRIPTIVE NOTE Final rep. Jdn 76; Sep 78.  
APR /6 82P  
PERSONAL AUTHORS Johnston, Brian A ;  
CONTRACT NO F08838-74 C-0014  
PROJECT NO 2054  
TASK NO 3W  
MONITOR AFCEC 1R-78-13  
UNCLASSIFIED REPORT

ABSTRACT: (U) Electroplating facilities, JR associated with aircraft engine maintenance bases operate by the Air Force, generate quantities of wastewater contaminated with cyanides. Although traditionally treated with chlorine, a process was developed by the Houston Research Corporation under Contract No F0801-72-C-005, using ozone to oxidize the cyanides. A demonstration plant was designed by CHAC and installed at Tinker Air Force Base to treat 3000 gal/min per month of primarily nickel strip waste at concentration up to 30,000 mg/l of total cyanide. A series of test runs proved ozone to be very effective and economically competitive for the destruction of simple cyanides and most metal complexes. The iron complex proved to be very difficult to destroy even in the presence of UV light and elevation (180 F) temperature. (Author)

DESCRIPTIONS. (U) "Metal Wader", "Pollution Abatement", "Cyanide", "Oxidation", "Uzone", "Electroplating, Waste treatment", "Metal Compounds", "Aircraft Maintenance" IDENTIFIERS (U) MUAFCEC020543W03, PEG67001R

AD-A033 089

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AD-A033 003

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## DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055628

AD-A032 279 1/2 0/3

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

(U) The Reduction of F-111 Low-Level Enroute Bird Hazards

DESCRIPTIVE NOTE Final rept.

MAR 70 28P

PERSONAL AUTHORS Coopston, Dennis E.

REPORT NO AFCEC-TR-70-11

PROJECT NO 2103

TASK NO. BP

## UNCLASSIFIED REPORT

666

ABSTRACT. (U) The F-111 aircraft has experienced a serious bird strike hazard because of its high-speed, low-level flying mission. This report examines the possible solutions and associated problems related to reducing enroute bird hazards. Four methods are discussed. (1) route studies to determine the relationship of habitat to species abundance and occurrence, (2) the use of radar to detect migratory songbirds, (3) determination of a migration prediction model, (4) determine scheduling of adjustments to coincide with low bird density and reduced activity. The success of any of the proposed methods is dependent upon the mission flexibility and availability of training alternatives at a given base. Results of the study may also apply to reducing bird strikes at Air Training Command student pilot training bases and to determine minimum bird hazards for proposed low-level routes for the B-1 Bomber. (Author)

DESCRIPTORS. (U) \*Jet fighters. \*Bird strikes. \*Aircraft. \*Airplanes. \*Flight paths. Low level. Low altitude. Aviation accidents. Reduction. Hazards. Terrain following. Detention. Inspection. Engines. Migration. Data acquisition. Accident investigations. Aviation safety. Radar

IDENTIFIERS. (U) PT03723F, MUAFCEC21038P09

AD-A032 410 13/2  
STANFORD RESEARCH INST MEND PARK CALIF  
(U) Source Emission Inventory for AQAM. Review of a Field Data Collection Program

DESCRIPTIVE NOTE: Final rept. 1 Dec 75-30 Jun 76.

JUL 78 104P

PERSONAL AUTHORS: Vizeau, Simon, Sheler, Hackworth,

CONTRACT NO. F04835-70-D-0132

PROJECT NO SRI-4744

MONITOR AFCEC

TR-76-20

## UNCLASSIFIED REPORT

ABSTRACT. (U) This final report summarizes the collection of operational data of air pollution emissions source at nine US Air Force bases. Comments and recommendations are presented on all aspects of the program and include the specification of an improved system of work, a critical review of relevant contents of air field data collection guides, and a documentation of the procedures used to handle the motor vehicle data areas where data pertinent to the inventory were found to be inadequate are noted. To improve the overall program and to benefit future efforts of data collection, it is recommended that an additional data collection guide be issued in the form of a specific shopping list of data items and associated data sources that can be carried into the field by any technically qualified person

DESCRIPTORS. (U) \*Air pollution. \*Air Force facilities. \*Data acquisition. Sources. Environmental protection. Data reduction. Automobile exhaust. Inventory. Aircraft exhaust. Information retrieval

IDENTIFIERS. (U) Exhaust emissions. National emissions data system. Storage and retrieval of aeronautic data

AD-A032 878

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AD-A032 410

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DTIC REPORT BIBLIOGRAPHY

AD A032 083 7/4 13/2

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

(U) The Adsorption of Chromium (VI) at the Oxide/Water Interface

DESCRIPTIVE NOTE Interim rept 1 Jul 74-30 Jun 75.

SEP 75 20P

PERSONAL AUTHORS MacNaughton, Michael G.

REPORT AD AFCEC-TR-75-17

PROJECT N3 2103

TASK NO 4C

UNCLASSIFIED REPORT

ABSTRACT. (U) Because of its toxicity, chromium has a potential environmental impact, and it is imperative that mechanisms which control the movement of this metal through the environment be known. It has been documented that adsorption to suspended and deposited material is important in controlling the concentration of heavy metals in natural waters. Numerous previous investigations have been concerned with the adsorption of hydrolyzable heavy metals, however, chromium exists in aqueous solution as the anionic oxocomplex. In this report data on adsorption of chromium and phosphate are compared at the water interface of various metal oxides. The conclusions of this investigation (1) for Al2O3 both chromium and phosphate adsorb at low pH's; however, upon increasing pH, there is decrease in the percentage adsorption. (2) chromium adsorption decreases with increasing ionic strength. (3) phosphate exhibits a higher specific adsorption energy than does chromium. (4) adsorption of both chromium and phosphate is low for solids which have isoelectricic points at low pH's. (5) with a more valid method of determining the surface potential other than the Hammett equation, the simple electrical double layer model can be used to give reasonable predictions of the pH and surface charge response for adsorption of anions (author)

DESCRIPTORS (U) "Chromium, Water pollution,  
"Absorption, Anions, Complex compounds, Electrochemistry,  
Physical chemistry, Surface chemistry, Transport

AD A032 083

UNCLASSIFIED

SEARCH CONTROL NO 058028

AD A032 083 CARRIED

Properties, Alumina, Phosphates, pH factor, Toxicity, Hydrolysis, Water, Interfaces, Oxides, Chromates, Mathematical models.

IDENTIFIERS (U) MIAT-CEC2 1034C41, PE837225

## UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055026  
AD-A031 783 13/2 AD-A030 588

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA  
(U) Improved Efficiency for Kirtland Air Force Base Solid Waste Collection

DESCRIPTIVE NOTE Final rept 1 Feb 74-1 Jun 76.  
JUN 79 NRP

PERSONAL AUTHORS FINK, Patrick T ; JACKSON, Jerry W .  
REPORT NO AFCEC-TR-76-2

UNCLASSIFIED REPORT

668

ABSTRACT: (U) In order to investigate the practical feasibility of conducting waste POIs (petroleum oil, lubricants) in heating pilot boilers, a field testing program was undertaken to obtain actual performance and air pollution data. Since most Air Force heating plants utilize FS-grade (No. 2, No. 6) fuel or natural gas as a primary fuel source, emphasis was placed on the installation of waste POI systems at three separate Air Force bases employing the use of these fuels. Various percentages of waste POI were burned in the test boilers with the corresponding fluctuation in stack emissions documented. Results of this study are reported in terms of quantity and hours of waste POI burned per installation, operational procedures, air pollution data, and recommendations for the safe installation of a compatible waste POI system. (Author)

DESCRIPTORS: (U) "Waste disposal", "Oil wastes", "Air pollution", "Air Force facilities", "Combustion", "Heating plants", "Recycled materials", "Fuels".

## UNCLASSIFIED REPORT

ABSTRACT. (U) This effort was initiated to find new ways to improve Air Force base level residential solid waste collection. This study investigated two collection modifications which were intended to improve system efficiency and, thus, conserve resources. The two modifications were: (1) optimum routing of the refuse collection vehicles; and (2) curbside paper bag collection. The study results showed that large economies (exclusive of paper bag costs) could be realized if the two system modifications were implemented together.

DESCRIPTORS (U) "waste disposal", "Solid wastes", "Waste management", "Air Force facilities", "Collection", "Cost effectiveness", "Routing", "Optimization", "fresh disposal

IDENTIFIERS: (U) "fresh disposal"

AD-A031 783

AD-A030 596

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UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

AD-A030 410 17/9 1/2 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION BOULDER COLD AERONAUT LAB  
(11) Development of a Doppler Radar Technique for the Detection of Bird Hazards to Aircraft  
DESCRIPTIVE NOTE Final rept 10 May 72-12 Dec 75.  
ERIC 75 Q2P PERSONAL AUTHORS Green, John L ; Balasav, Ben S .  
PROJECT NO AF-2103 MONITOR APSEC TR-76-17

UNCLASSIFIED REPORT

ABSTRACT (U) The purpose of this research project was to develop a radar technique to detect the presence of flying birds potentially hazardous to aircraft near airport runways to distinguish them from other radar targets. To estimate the size and number of birds in flight to assess the hazard the motions of a bird in spectrum was characterized by a distinctive velocity signature that can be detected by radar. These 'aural signatures' were identified by Doppler technique and verified by visual sightings. This report provides a description of the analysis techniques, compares range-gated to range-gated systems and also conventional and Doppler radars. A discussion concerning identification of a typical system to a Doppler system is included. A method of determining the actual volume of birds in the target volume is discussed. The report also includes a scene-by-scene description of a film presentation made to more fully quantify the Doppler technique (Author)

DESCRIPTORS (U) Doppler radar, Bird strikes, Aviation safety, Birds, Aircraft, Hazards, Detection, Radar tracking, Airports

IDENTIFIERS (U) Radar ornithology

SEARCH CONTROL NO 055028

AD-A030 285 13/2 5/2 LITTLE (ARTHUR D) INC CAMBRIDGE MASS  
(U) A Methodology for Preparing Environmental Statements  
DESCRIPTIVE NOTE Final rept May 74-Aug 75.  
AM 75 217P PERSONAL AUTHORS Hallstrom, David I .  
CONTACT NO F 28801-73-D-0027  
MONITOR AFSEC TR-75-28

UNCLASSIFIED REPORT

ABSTRACT (U) This report provides instructions for Air Force field personnel in the methods for preparing environmental statements. The report covers the following areas: Introduction to the environment, review of Air Force procedures for assessment and reporting impacts of various actions, establishing and maintaining an environmental baseline data and information system, preparation of the proposed action, description of the existing environment, identification of impacts, and other topics - alternatives, unavoidable impacts, and resources. The report is written for a person with a technical background, but without experience in environmental analysis.

DESCRIPTORS (U) Environmental impact statements, Air force planning, Manuals, Methodology, Assessment, Reports, Data acquisition, Data bases, Information systems, Impact, Resources, Utilization, Preparation

IDENTIFIERS (U) Alternatives

## UNCLASSIFIED

## DTIC REPORT BIBLIOGRAPHY

AD-A030 308 13/2

NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL ENGINEERING RESEARCH FACILITY

(U) Evaluation of IBM Vehicle Scheduling Program for Air Force Base Refuse-Collection Scheduling

DESCRIPTIVE NOTE: Final rept Feb 73-Dec 75.

APR 76 SSP

PERSONAL AUTHORS: LUZELLINE, Harold J.

REPORT NO: CERF-EE-8

CONTRACT NO: F29001-76-C-0018

MONITOR: AFCEC

TR-76-14 UNCLASSIFIED REPORT

**ABSTRACT:** (U) The IBM Vehicle Scheduling Program (VSP) was used to schedule refuse collection at five Air Force bases. The application of refuse collection can reduce computer scheduling of refuse collection can reduce manpower, distance travelled, and the number of vehicles required by up to 20 percent. Difficulties involved in using the IBM program and in producing the final route maps and schedules indicate that a computer program that would do what is currently done by hand should be written (or obtained if one exists).

**DESCRIPTORS:** (U) Air Force facilities, \*solid wastes, \*garbage disposal, \*Scheduling, \*garbage disposal, \*network flows, \*mathematical models, \*computer programs, \*FORTRAN, \*Collection, \*Optimization

**IDENTIFIERS:** (U) \*Solid waste collection systems, \*Vehicle scheduling program

## SEARCH CONTROL NO: 085028

AD-A029 734 21/4 20/3 13/12

## EXXON RESEARCH AND ENGINEERING CO LINDEN N J

(U) Evaluation of the Hazards of Static Electricity in POL Systems

DESCRIPTIVE NOTE: Final rept Jun 74-Dec 75.

JAN 76 151P

PERSONAL AUTHORS: Dukok, N. A., Lunt, R. S., Young, D. A.

CONTRACT NO: F29001-74-C-0126

MONITOR: AFCEC

TR-76-1 UNCLASSIFIED REPORT

**ABSTRACT:** (U) Tests were conducted at Air bases and in a full-scale rig to evaluate the hazards of static electricity in POL systems. Field testing at two air bases revealed a low level of charge in JP-4 fuel delivered to aircraft through DND filter-separators. Very low levels result from the high conductivity of JP-4 due to the presence of approved DND corrosion inhibitor and the design of filter separator which provide considerable residence time for charge relaxation. Single stage filter separator units were shown to generate less charge than older two-stage units. Teflon screens charged at about half the level of paper separators. Aluminum hydrant systems were found to have a lower charging tendency than carbon steel systems.

**DESCRIPTORS:** (U) \*POL storage, \*Electrostatic charge, Hazards, \*Static electricity, \*Static dischargers, fuel filters, Separators, \*jet engine fuels

IDENTIFIERS: (U) JP-4 fuel

AD-A030 205

AD-A029 734

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NYC REPORT BIBLIOGRAPHY		SEARCH CONTROL NO	SEARCH CONTROL NO
AD-A028 628	13/2	AD A028 079	080026
ARMY ENGINEER WATERWAYS EXPERIMENT STATION	1/5	1C/5	13/2
VICKSBURG			
MISS			
Use of Recycled Materials in Airfield Pavements		AIA FORCE CIVIL ENGINEERING CENTER YNDDALL, AFB FLA	
(11) Feasibility Study		(1) Treatment and Recovery of Photographic Black Solutions	
Final rept Oct 74-Aug 75.		Using Electrolytic Regeneration	
DESCRIPTIVE NOTE		DESCRIPTIVE NOTE	
FEB 76	12P	JAN 76	25P
PERSONAL AUTHORS		PERSONAL AUTHORS	
Laving, Raymond J.		Bennett, Brian D.	
MONITOR		REPORT NO	
AFCEC		AFCEC-TR 76-6	
TR 76-7		PROJECT NO	
		AT 2054	

UNCLASSIFIED REPORT

**ABSTRACT:** (1) This report describes an investigation of the economic and technical feasibility of recycling old pavements and used paving materials into new pavement construction and maintenance. It is in effect a state-of-the-art study based on literature reviews and job site visits. Four major procedures were identified as being used to recycle or reutilize pavements and paving material. These are: (1) removed and crushed materials, (2) removed and reprocessed materials, (3) hauler/processor methods, and (4) hauler/planner scrapper or remix methods.

DESCRIPTORS	(II) recycled materials, pavements, airports, waste disposal, concrete, asphalt, literature surveys, feasibility studies
DESCRIPTORS	(III) building codes, architecture, construction

**Effectiveness.** Water pollution. Pollution abatement. Motion picture photography. Aerial photography

### IDENTITIES (III) FOUNDATIONAL

AB-A028 528

AD 1026 879

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572

## UNCLASSIFIED

AD-A026 487 Q/10  
 SAN DIEGO STATE UNIV CALIF CENTER FOR REGIONAL ENVIRONMENTAL STUDIES  
 (U) Ecological Assessment of Vandenberg Air Force Base, California. Volume II. Biological Inventory 1974/75  
 DESCRIPTIVE NOTE. Final rept May 74-Aug 75.  
 MAY 76 204P  
 PERSONAL AUTHORS. Constance, Harry N., Nahrat, Clark R.  
 CONTRACT NO. F44620-75-C-0008  
 MONITOR AFCEC  
 TR-76-1B-Vn1-2

DTIC REPORT BIBLIOGRAPHY  
 SEARCH CONTROL NO 050502A  
 AD-A026 243 13/2 21/4  
 AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA  
 (U) Air Force Fuel Dumping. October 1974 to March 1975  
 DESCRIPTIVE NOTE. Final rept 1 Oct 74-31 Mar 75  
 AFN 75 46P  
 REPORT NO. AFCEC-TR-75-21  
 PROJECT NO. AF - 1800  
 TASK NO. 19008W

UNCLASSIFIED REPORT

ABSTRACT (U) Listings and summaries of all reported Air Force fuel dumps between 1 October 1974 and 31 March 1975 are given and are broken down by major command and by aircraft type. The distributions of fuel dumps by geographical area, size, and altitude are also examined. Several geographical areas in which fuel dumping is most likely to have a significant environmental impact are identified. Most fuel dumps fall into one of two distinct classes and can be studied by investigating in detail a typical member of the class. The implications of this simplification for the future conduct of the fuel dumping project are discussed (Author)

DESCRIPTORS: (U) \*Air pollution, \*Fuels, Tables (Data), Air Force operations, Air Force facilities, Geographical distribution, Aircraft, Environmental impact statements, Altitude, Time, Weight reduction (Author)

IDENTIFIERS (U) \*fuel dumps, F-111 aircraft, KC-135 aircraft

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE. See also Volume 1, AD-A025 800

ABSTRACT. (U) The second volume of a three volume report presents the data base from a survey of terrestrial environmental conditions at Vandenberg AFB, California, carried out from July 1974 to June 1975. The study was undertaken to provide basic data for assessment of the environmental impact of the Space Transport System planned for Vandenberg AFB and for management of the land resources of the base. Details are given of the floral and faunal investigations, including locations, methods, and procedures. Narrative and tabular data are provided on climate, soils, aquatic resources, vegetation, and game and non-game vertebrates.

DESCRIPTORS (U) \*Ecology, \*Natural resources, \*Air Force facilities, \*Environmental management, Surveys, Rivers, Lakes, Sampling, pH factor, Temperature, Nutrients, Fishes, Trees, Shrubs, Aquatic plants, Invertebrates, Vertebrates, Productivity, Aquatic animals, Vegetation, Wildlife, Mammals, Tabis(Data), California  
 IDENTIFIERS (U) \*Vandenberg Air Force Base, Santa Barbara County(California), Environmental impacts, Space transport system

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 0505028

AD-A025 800 0/8

SAN DIEGO STATE UNIV CALIF CENTER FOR REGIONAL  
ENVIRONMENTAL STUDIES

(U) Ecological Assessment of Vandenberg Air Force Base,  
California Volume I Evaluation and Recommendations

(U) Continuous On-Line Monitoring of Total Organic Carbon  
DESCRIPTIVE ADLT Final rept Jan-Apr 78.

DESCRIPTIVE NOTE Final rept May 74-Aug 75.

MAY 78 152P

PERSONAL AUTHORS Coulombe, Harry N ; Cooper, Charles F .

PERSONAL AUTHORS Coulombe, Harry N ; Cooper, Charles F .

CONTRACT NO F44620 75-C-0008

MONITOR AFCCC

TR-78-15

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT. (U) Continuous on-line monitoring of total organic carbon was performed at an Air Force sewage treatment facility using an Ionsics Total Organic Carbon Analyzer. This instrument was installed and operated to determine its potential use in Air Force monitoring programs and the validity of a total organic carbon (TOC) to biochemical oxygen demand (BOD) correlation for the wastewater analyzed. Information was obtained on the operation and required servicing for proper instrument application. Analysis of data collected during this study indicated that a valid long term correlation of TOC and BOD could be used to effectively monitor treatment plant performance. (Author)

DESCRIPTORS (U) Sewage treatment. Analyzers. Monitoring. On line systems. Water pollution. Carbon. Biochemical oxygen demand. Instrumentation. Performance engineering. Maintenance

IDENTIFIERS (U) Total organic carbon. Water pollution detection

SUPPLEMENTARY NOTE See also report dated Aug 78. AD-A020 027

ABSTRACT (U) The first volume of a three volume report summarizes the results and conclusions of a survey of terrestrial environmental conditions at Vandenberg AFB, California, carried out from July 1974 to June 1975. The study was undertaken to provide basic data for assessment of the environmental impact of the Space Transport System (STS) planned for Vandenberg AFB and on management of the land resources of the base. The significance of Vandenberg AFB as one of the last large undeveloped areas in coastal California is discussed. Evaluations are presented of the biotic aspects of the ecological setting: freshwater ecological conditions, vegetation, and game and non-game wildlife, including amphibians, reptiles, birds, and mammals. Species and ecosystems of high ecological sensitivity or importance are discussed in the context of the STS. Recommendations are presented for management of the renewable natural resources of the base

DESCRIPTORS (U) Ecology. Environmental protection. Air Force facilities. Conservation. Management. Natural resources. Field tests. Surveys. Wildlife. Tables (data). California. Coastal regions. Soils. Fresh water.

IDENTIFIERS (U) Vandenberg Air Force Base.

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AD-A025 800 CONTINUED

Environmental Impact statements, Ecosystems, Santa Barbara County (California). Local studies. Recommendations

OTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A025 799 15/5 15/7

APPLIED ENGINEERING RESOURCES INC SANTA BARBARA CALIF

(U) Air Mobility Shelter Conceptual Study

DESCRIPTIVE NOTE Final rept. Jul 74 Apr 75.

SEP 75 180P

PERSONAL AUTHORS: Bedford, R. Jaffe, M.

CONTRACT NO F29001-74-C-0112

MONITOR: AFCEC

TR-75-29

## UNCLASSIFIED REPORT

ABSTRACT (U) This report summarizes an evaluation of existing air transportable shelters and identifies areas in which improvements can be made in the future. In general, the study suggests that existing shelters have been quite successful with respect to air transportability, overall weight, rapid erection and striking, and adaptability to diverse uses. Existing shelters have not, however, been totally satisfactory with respect to durability, reliability, compatibility with extremes of environment, and commonality of elements. The majority of these problems have been due to limitations in the materials and manufacturing techniques utilized, rather than from any basic shortcomings of the shelter concepts. Accordingly, this study suggests that use of premium-quality materials, advanced manufacturing techniques, and more conservative design allowances will result in superior shelters in the 1980's.

DESCRIPTIONS: (U) \*Bare bases, \*Air transportable equipment, \*Shelters, \*Mobile operations, Manufacturing, Composite materials, Weatherproofing, Kits, Military

IAC NO PL-024815

IAC DOCUMENT TYPE: PLASTIC - MICROFICHE --

IAC SUBJECT TERMS P - (U)Composites-Air mobile shelters, plastics-Inflatable structures, Kevlar/Epoxy-Mobile shelters, Polycarbonate frame-Portable equipment, HDP-Tents, Portable-Shelters, Shelters-Military applications.

AD-A025 800

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AD A025 799 CONTINUOUS  
22 UNLIMITED

DTIC REPORT 3181 TOGRAPHY

SEARCH CONTROL NO 050026

AD A025 183 13/2 9/2 8/13 12/1  
NEW MEXICO UNIV ALBUQUERQUE ERIC H WANG CIVIL  
ENGINEERING RESEARCH FACILITY

(U) Evaluation of Substitute Input for NCEI Bond Damage  
Repair Code

DESCRIPTIVE NOTE Final rept 0 Jan-6 Oct 75.

MAR 76 56P

PERSONAL AUTHORS Baird, Glenn T.

REPORT NO CERF-AP-18

CONTRACT NO F29001-74-C-0030

PROJECT NO AF-2104

TASK NO 210448

MONITOR AFCEC  
TR-70-4

UNCLASSIFIED REPORT

(U) This research project was concerned with the evaluation of substitute input to a computer program which is used to analyze the performance of repaired bomb craters. The typical materials used in the rapid repair of bomb craters were tested in various states of stress to obtain soil strength and deformation parameters for use in the computer code. A concrete sand, two gravel, and a well-graded crushed limestone were tested in hydrostatic compression, constant mean normal stress, and triaxial compression for evaluation of their nonlinear bulk moduli, shear moduli, and moduli of elasticity. Laboratory testing was performed with a modified Hydram Stabilomat. Bulk and shear moduli were inputted to the axisymmetric finite-element computer code and the nonlinear results were compared with the linear results. Triaxial compression containing pressures are suggested for the selected materials. With the linear moduli computed from the triaxial compression tests performed at these pressures, deflections equivalent to those computed with nonlinear moduli can be computed. The computer input for the reduced and laboratory testing was greatly simplified.

AD A025 799

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## DTIC REPORT BIBLIOGRAPHY

AD-A025 163 CONTINUED

DESCRIPTORS (U) "Construction materials", "Computer programs", "Repair, Stress analysis", "Finite element analysis", "Data reduction", "Casters", "Bond strength", "Soil mechanics", "Bulk modulus", "Modulus of elasticity", "Shear properties", "Deformation, Saint, Gravel, Lime", "Limestone", "Compressive properties, Three dimensional, Deflection

IDENTIFIERS (U) Shear modulus

## SEARCH CONTROL NO 055026

AD-A025 158 13/2 7/4

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

(U) Vapor phase Spectra for Air Pollution Studies

DESCRIPTIVE NOTE: Final rept 1 Jul 72-31 Nov 74.

AUG 75 147P

PERSONAL AUTHORS: BURGE, Robert R.; HANEY, James T.; RICCO, F. Edward

REPORT NO: AFCEC-TR-75-15

PROJECT NO: AF-1900

TASK NO: 1R008#

## UNCLASSIFIED REPORT

ABSTRACT (U) Infrared absorption spectra of the following substances in the vapor phase are presented acetaldehyde, acetonitrile, acetone, ammonia, carbon dioxide, carbon monoxide, ethane, ethylene, formaldehyde, formic acid, hydrogen chloride, hydrogen cyanide, hydrogen sulfide, methane, methanol, nitric oxide, nitrogen dioxide, nitrous oxide, ozone, sulfur dioxide, and water. Resolution is 0.5/cm and low sample pressure further enhances line structure of the absorption bands. The frequencies of nearly 2000 absorption lines for these compounds, accurate to 0.1/cm, are listed in tabular form. A discussion of techniques to eliminate noise in Fourier transform spectroscopy is included (Author)

DESCRIPTORS (U) "Air pollution", "Infrared spectra", "Vapor phases", "Fourier spectroscopy", "Carbon monoxide", "Carbon dioxide", "Acetone", "Ammonia", "Ethane", "Ethylene", "Formaldehyde", "Formic acid", "Hydrogen chloride", "Hydrogen oxides", "Ozone", "Water", "Sulfur oxides", "Methane", "Hydrogen sulfide", "Hydrogen cyanide".

IDENTIFIERS: (U) Acetaldehyde, Acetone, Methane, "Fourier" spectroscopy

AD-A025 158

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## DTIC REPORT BIBLIOGRAPHY

AD A024 269	1/5	13/2	SEARCH CONTROL NO	055028
CLARKSON COLL OF TECHNOLOGY	POTSDAM NY		AD-A022 882	13/2
(U) Cumulative Deflection and Rigidity Pavement	Serviceability		FACTOR ENTERPRISES INDUSTRIES INC MARICK R I	1/3
DESCRIPTIVE NOTE	Final rept Jul 74-Sep 75.		(U) Activated Carbon Treatment of Phenolic Paint Stripping	
NOV 75	02P		Wastewater	
REF ID: A2195	Hightower, William H.		DESCRIPTIVE NOTE	Final rept May 74-May 75.
CONTRACT NO	F20601 75-C-0002		AD 7-	132P
PROJECT NO	AF 2104		PERSONAL AUTHORS	Acerrotti, Anthony E.
CLASS NO	2104 A		CONTRACT NO	FOR833-74-C-0005
ACM 11-13	AFCEC		PROJECT NO	AF-2051
	TR 75 20		MONITOR	AFCEC

## UNCLASSIFIED REPORT

**ABSTRACT** (U) This report describes efforts to relate the energy required to a rigid pavement system (as measured by cumulative deflections) to the condition of the asphaltic concrete from the wear test. The American Association of State Highway Officials Road Test showed no results that could be used for predictive purposes. Use of averaged data points indicated there exists a very gradual cumulative deflection beyond which pavement

DESCRIPTORS (U) Pavements, Terminal flight facilities, Dynamic response, Performance engineering, Deflection, Life expectancy, Dynamic loads, Energy transfer

**ABSTRACT** (U) The use of activated carbon for removal of phenol from wastewater is a well demonstrated and generally accepted treatment method. The Air Force operated a number of facilities for the decontaminating of aircraft and related equipment and the wastewater generated contained high concentrations of phenol. A study was conducted to ascertain both the economic and technical practicability of using a granular carbon system for treating large volumes of this type of phenol bearing wastewater. Basically, this work involved two phases. The initial phase was performed in the laboratory and involved an in-depth characterization of the wastewater and the evaluation of different activated carbons for treating this wastewater. The second phase was performed on-site at Kelly Air Force Base and involved operating a pilot plant for treating phenol wastewater. The carbon was exhausted five times and thermally regenerated four times. The pilot plant was operated intermittently and was on-site for a period of six months. The technical feasibility of using activated carbon on this specific wastewater was demonstrated and the cost of constructing and operating full size plants was determined. Color illustrations reproduced in black and white

**DESCRIPTORS** (U) Phenols, Water pollution, Paint removal, Activated carbon, Sewage treatment, Adsorption, Concentration/Chemistry, Pilot plants, Cost estimates.

AD A024 269

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AD-A022 982 CONTINUED

field tests. Chromium laothemis. Aircraft finishes.  
Chloromethanes Removal. Air Force facilities  
IDENTIFIERS (U) \*Water pollution control. Skid resistance  
Water treatment. Design criteria

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055020

AD A021 959 1/5 12/2

AIR FORCE CIVIL ENGINEERING CENTER TINDALL AFB FLA

(U) Analysis of the Standard USAF Runway Skid Resistance  
Tests

DESCRIPTIVE NOTE Final rept. (u) 70-Dec 74.

MAY '78 28pp

PERSONAL AUTHORS Williams, John H.

REPORT NU AFCEC-TR-78-3

UNCLASSIFIED REPORT

ABSTRACT (U) Data gathered during the Air Force Civil  
Engineering Center (AFCEC) standard skid resistance  
surveys conducted on 86 runways during the period  
November 1973 to September 1974 are analyzed. This  
report outlines the major influences leading up to the  
present AFCEC program to determine runway skid resistance  
characteristics, requirements made to the program,  
description of equipment used to determine runway skid  
resistance characteristics, operating and test procedures  
and analysis of the skid measurement program (author)

DESCRIPTIONS (U) \*Runways. \*Skid resistance. Test  
methods. Texture. Concrete. Aircraft. Aircraft tires.  
Hydroplaning. Friction. Skidding. Deceleration. Measuring  
instruments. Air Force. Civil engineering

IDENTIFIERS (U) \*Skid resistance. Skidometers

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AD-A021 959

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DTIC REPORT BIBLIOGRAPHY  
SEARCH CONTROL NO 035028  
AD A021 352 1/0 13/2 AD A021 352 1/5 13/3 13/2  
NTH MEXICO DIV ALBUQUERQUE ERIC H WAVA CIVIL  
FEDERAL HIGHWAY RESEARCH FACILITY  
(U) Evaluation of liquid binders for airfield ready damage  
Repair  
DESCRITIVE NOTE Final rept 24 Apr 74-JC Jan 75.  
JAN 15 APR ANO 75 51P  
PERSONAL AUTHOR Nilsen, John P., Gabairo, Vincent,  
REPORT NO (ERT-AP-14 CONTRACT NO F08036-75-C-0010  
CONTRACT NR F28001-74-C-0010  
MONITOR AFCEC  
NUMBER AFCEC TR-75-19

## UNCLASSIFIED REPORT

ABSTRACT (U) A laboratory and a field study were conducted to evaluate the use of an epoxy binder to stabilize a gravel layer for the repair of bomb crater's in airfield pavements. The particular repair system involved gravel consisted of backfilling the crater with selected material sand to within 12 in of the top of the pavement and a 3/4-in uniform gravel to the surface. The gravel was stabilized by a liquid epoxy resin which had a cure time of 10 to 15 min. The field test section was subsequently withstanded 1000000 cycles of an F-4 tire loaded to 30,000 lb without any measurable elastic or permanent deflection.

REGRATORS (U) Lancing filon, "Under damage repair", Debris, Cratering, Epoxy resins, Backfills, Stabilization, Binders

## UNCLASSIFIED REPORT

DESCRITIVE NOTE Final rept May-Aug 75.  
PERSONAL AUTHORS Eoyko, Leo I., Sawyer, Richard G.  
REPORT NO SUIC TR-75-197  
CONTRACT NO F08036-75-C-0010  
MONITOR AFCEC  
NUMBER AFCEC TR-75-19

## UNCLASSIFIED REPORT

ABSTRACT (U) This report describes a series of tests to evaluate a system for rapidly repairing airfield pavement using polymer concrete (synthetic polymer plus aggregate), thermally cured by microwave power. The technique developed by the Syracuse University Research Corporation (SURC) for highway maintenance uses a truck-mounted 50-kilowatt microwave generator to irradiate areas patched with polymer concrete. Test results indicate that the polymer concrete can be cured in a fraction of an hour, bonds well to old pavement material, is very strong, and possesses other qualities which make it naturally suited for airfield use.

DESCRIPTORS (U) Survey, Backfill, damage, Repair, Polymers, Polymerization, Microwaves equipment, Irradiation, Coating, Pavements

IDENTIFIERS (U) Polymer concretes

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DTIC REPORT BIBLIOGRAPHY  
SEARCH CONTROL NO 055028  
AD-A021 315 CONTINUED

MARTIN MARIETTA AEROSPACE ORLANDO FLA  
(U) Road Damage Repair (RDR) Damage Prediction  
Appendix 3

DESCRIPTIVE NOTE. Final report 14 Feb-15 cont 75.

DATE 78 411P

PERSONAL AUTHORS Brooks, George W ; Birmingham, John F ;  
Mayar, Phil W ;

CONTRACT NO F2001-78-C-0053

PROJECT NO AF-2104

TASK NO 210120

INSTITUTION AFRCIC  
TR-78-24-Vc1-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE. See also Volume 1, AD-A020 941

ABSTRACT (U) Knowledge of initial damage and the capability to predict damage from potential hostile attack are required to allow Base Damage Repair (BDR) personnel to plan base recovery activity and rapid runway repair. The objective of this effort was to conduct existing data on identified pavement effects as functions of pavement and weapon parameters, identify those parameters having a significant effect on pavement damage, repair time effort, and to generate damage prediction relationships for use by BDR monitors. The collected data were placed in a consistent format in a computerized data file. By plotting the data and subjecting them to various analytical procedures, significant parameters affecting damage were identified. Mathematical relationships were developed between the data, and damage prediction nomographs were generated for the the no repair levels consistent. These prediction relationships are in a form readily usable by BDR personnel and enable rapid damage prediction computations and subsequent runway repair planning operations.

CRITIQUES (U) Landing field, "Road damage, repair, damage assessment, mathematical prediction, maintenance."

AD-A021 315

UNCLASSIFIED

Pavements, Craters, Weapons effects, Computer applications, Data bases, parametric analysis, Soil mechanics, Tables(Dates), Air force planning

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AD-A020 941 1/5 19/4 13/2 14/2  
 MARIN MARIETTA AEROSPACE OPI ANDO PLA  
 (U) *Ground Damage Repair (BDR) Pavement Prediction*  
 Technical Discussion

DESCRITIVE NOTE Final rept 13 Feb-15 Oct 75.  
 OCT 75 138P

PERSONAL AUTHORS Brooks, George W., Cunningham, John E.,  
 Mayer, Paul W.

CONTRACT NO F28001-75-C-1053

MONITOR AT&C TR-75-24

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 085028  
 AD-A020 922 7/3 14/2 7/5  
 AIR FORCE CIVIL ENGINEERING CENTER YTDALL AFB FLA  
 (U) *The Evaporation and Deposition of N-Nitroso Dimethylamine in Aqueous Solutions*

DESCRITIVE NOTE Final rept Feb 75-Mar 75.  
 MAR 75 22P

PERSONAL AUTHORS Muchaughton, Michael G.; Stauffer, Theodore S.

REPORT NO AFCEC-TR-75-9

## UNCLASSIFIED REPORT

ABSTRACT (U) The fate of N-Nitroso Dimethylamine (NMDA) in aqueous solutions and in percent clastic waste streams which is produced in the manufacture of unsymmetrical dimethyl hydrazine (UDMH) is investigated. These studies were designed to approximate conditions which would affect evaporation and/or degradation of NMDA in an open lagoon. It was found that for basic solutions, the removal was primarily evaporation. Whereas, evaporation is low for acid solutions and accounts for half the removal in neutral solutions. The rate of photolysis is greater in acid solutions. Additional conclusions are that nitrite severely inhibits the photolysis of NMDA in acid and neutral pH, and the increase in ionic strength slightly increases the evaporation rate. The implications of the above results for leaching of the NMDA will vary with the waste streams very rapidly unless the waste is mineralized. If the waste is mineralized, then photolysis would predominate until nitrite is present. In which case, little of the NMDA would leave the lagoon either by volatilization or photolysis.

(D) ABSTRACT. (U) Several test programs have been conducted in recent years to define the level of damage sustained by airfield pavement systems which are subjected to conventional weapon detonations. Knowledge of initial damage and the capability to predict damage from possible hostile attack are required to allow both damage repair (ADB) personnel to plan, base recovery activity and rapid turn-around repair. The objective of the effort reported herein was to collect existing data on airfield pavement effects, as functions of pavement and weapon parameters, identify those parameters having a significant effect on pavement damage, repair time on effort, and generate damage prediction relationships for use by ADB engineers.

DESCRIPORS (U) Standing fields, "Bomb damage", "Repair", "Damage assessment, predictions, maintenance, pavements, craters, "Watson effects

DESCRIPTIONS (U) "Water pollution, "Chemical analysis, Nitroso compounds, "Carcinogens, Food, Soils, Sewage, Dimethyl hydrazine (U-1), "Degradation, Public health, Photolysis, "Waste water, "Wastes(industrial), "Nitrates, "Evaporation

IDENTIFIERS (U) "Dimethylamine/N Nitroso

AD A020 941  
 AD-A020 922

IAC NO PL-9003199  
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ADP 8725

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028

AD-A019 107 13/1 10/1

ICAC DOCUMENT TYPE PLASTIC - MICROFICHE

ICAC SUBJECT TERMS: P- (1) Inorganics pollution R and D, Water and air pollution-E and D, (2) Nitroso dinitroso dinitro, 22 NIT, 22 UN limited.

(U) Optimization of Energy Usages in Military Facilities  
(Phase 1)

DESCRIPTIVE NOTE Interim rept Nov 74-Jul 75.

OCT 75 48P

PERSONAL AUTHORS: Hittle, D., Herron, D. ;

REPORT NO AFCEC-TR-76-22

PROJECT NO AFNL-73-223

UNCLASSIFIED REPORT

ABSTRACT: (U) A computer model was developed for predicting hourly building thermal loads and simulating the response of heating and cooling systems to these hourly loads. The rigorous algorithms employed in the program permit determination of the effects of building and system design variables on energy consumption. The report presents results of the program application to a test case building at four sites.

DESCRIPTORS (U) Military facilities, Fuel conservation, Buildings, Heating, Cooling, Computerized simulation, Forecasting

IDENTIFIERS (U) Energy consumption, Heat consumption, Electric power consumption, Space heating, Air conditioning, Heating load, Cooling load

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NTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055624

AD-A018 318 13/2

U.S. AIRCRAFT CORP SAN ANTONIO TEX

(U) Advanced Trickling Filter for Wastewater Treatment

DESCRIPTIVE NOTE Final rept Jan-Dec 74.

NUC 76 41P

MENTAL ADJRS Luscher, E. W.

QUANTITY NO FOR338-74-C-0007

PROJECT NO AF-2054

MANUFACTURER AFCEC

TR 76 8

## UNCLASSIFIED REPORT

ABSTRACT (U) A prototype advanced trickling filter unit using a former silica aeration was designed, constructed, installed and evaluated. The reduction in biochemical oxygen demand (BOD) and total suspended solids (TSS) were the parameters of most interest. The design hydraulic load of the unit was 700,000 gallons per day. The design organic load (BOD) was 80 pounds per 1000 cubic feet per day. The design solids load was 60 pounds per 1000 cubic feet per day. The measured organic and solids concentrations were 10 mg/l and 40 mg/l, respectively. Laboratory data show that the effluent BOD was reduced from 28 mg/l to 18 mg/l. This indicates a reduction that will allow the upgrading of existing treatment plants to a level consistent with newer effluent limitations. The installation and operation of Gurnig's advanced trickling filters were economical. These filters demonstrated their effectiveness and efficiency as a wastewater treatment system.

DESCRIPTORS (U)

Performance (Engineering), Construction, Efficiency, Oxygen Solids, Concentration (Chemistry), Installation, Costs

IDENTIFIERS (U)

Trickling filters, Design, Biochemical Oxygen, ~~in~~ Silica glass

AD-A018 318

## UNCLASSIFIED

SEARCH CONTROL NO 055624

AD-A018 219 13/8

AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA

(U) Efficiency of Silver Recovery from Air Force Photographic Operations

DESCRIPTIVE NOTE Final rept Aug 74-Jun 75.

JUL 75 34P

PERSONAL AUTHORS Bennett, Brian D.

REPORT NO AFCEC-TR-75-11

PROJECT NO AF-2054

TASK NO 203403

## UNCLASSIFIED REPORT

ABSTRACT (U) In order to ascertain the efficiency of the silver recovery techniques presently employed at United States Air Force photographic processing facilities a field sampling program was undertaken to obtain actual performance data. The silver recovery by metallic salt replacement utilizing cartridges was found to be the most frequently applied method of recovery. emphasis was placed on this recovery technique. An electrolytic recovery tailing operation was also sampled to determine the efficiency of recovery utilizing this technique. Results of this study are reported in terms of cartridge performance with time, volume of fix processed, and average silver loading. Data reflect actual in the field efficiencies and indicate that effective silver recovery techniques are available for Air Force application (Author)

DESCRIPTORS (U)

Silver, Reclamation, Recovery, Photographic Film, Civil Engineering, Efficiency, Electrolytes, Processing, Water pollution, Extraction

IDENTIFIERS (U)

Environment, Silver, Recovery, Photographic waste

AD-A018 219

## UNCLASSIFIED

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AD A013 088 1/8 18/12 18/6 01C REPORT BIBLIOGRAPHY SEARCH CONTROL NO 080088  
AD A010 723 1/8  
AIR FORCE CIVIL ENGINEERING CENTER TYNDALL AFB FLA  
(U) ~~Search Shelters~~  
DESCRITIVE NOTE Final rept Dec 73-Aug 74.  
MAY 75 1715  
PERSONAL AUTHOR: Tadzhinian, Jean R. McDonald, Bernard D.  
DARBY, E. J.  
REPORT NO: AFCEC TR-75-6  
PROJECT NO: AF 3080  
UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT (U) The project investigated four test sections on asphaltic concrete (AC) and eight test sections on portland cement concrete (PCC) for methods of reinforcing runway paint marking all-pervasive paint removal emblem AC surfaces to maintain adequate skid resistance. Using small angular aggregate with the glass spheres for the standard 1500-lb. wheel load, skid resistance at 100% equal to that of the adjacent unmarked pavement.

DESCRIPTORS (U) Pavements, Runways, Skidding, Markers, Paints, Removal, Bitumous coatings, Test methods, Surfaces, Friction, Test equipment, Military facilities

IDENTIFIERS (U) Portland cements

REF ID: A013 089

DO

REF ID: A013 089  
INSTITUTE (U) Shelters, Military aircraft, Expendable structures, Assembly, Paints, Insecticides, Structures, Closure, Field tests, Environmental tests, Resins (Structural), Metals  
AFFILIATES (U) Evaluation Bureau base project

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AD A013 089

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 085028

AD-A007 033 15/5 14/2

GENERAL AMERICAN TRANSPORTATION CORP MILIES ILL GENERAL AMERICAN RESEARCH DIV

(U) Procedures for the Non-Destructive Evaluation of Plastic Airfield Pavements

(U) Nondestructive Inspection of Shelter Panels

DESCRIPTIVE NOTE Final rept Oct 72-Jan 75

Final rept Sep 73-May 74.

JAN 75 98P

PERSONAL AUTHORS Hanson, Douglas I.

REPORT NO AFCEC TR-75-1

UNCLASSIFIED REPORT

ABSTRACT (U) A procedure for the non-destructive evaluation of airfield pavement is presented. The procedure consists of accomplishing a condition survey using a mechanistic procedure and the successful break of a deflection study using the beam and an aircraft at close to maximum load. Procedures are developed and presented for use in the prediction of either the allowable aircraft gross load at specified operational levels or the prediction of the allowable coverage levels at specified gross loadings.

DESCRIPTIONS (U) Pavements, \*Runways\*, Stiffness, Deflection, Performance Engineering, Loads (Forces), Defects (Materials), Ratings, Flexible structures, Nondestructive testing

IAC NO 117-002771

IAC DC 74/M: TYPE NTIAC - MICROFICHE --

IAC SUBJECT TERMS N-(U) PAVEMENTS, \*LOADS (FORCES), DEFLECTION, TESTING, TEST METHODS.

NONSTRUCTIVE INSPECTION OF SHELTER PANELS

PERSONAL AUTHORS Kraska, Irvin R., Wolf, John J.

CONTRACT NO F33615-71-C-1832

PRODUCT NO AF-2054

TASK NO 205402

MONITOR AFCEC TR-75-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also report dated May 74, AD-782 221

ABSTRACT (U) This report summarizes the results of an effort to develop equipment and procedures to inspect sandwich panels in air transportable shelters in the field. A rapid and simple-to-operate system has been developed, utilizing a unique eddy sonic technique for semi-faced panels and pitch-catch ultrasonic techniques for non-metal faced panels. The location(s) of debonds and free moisture in the panel are reliably detectable with the system. A prototype model has been successfully field tested.

IDENTIFIERS (U) Shelters, \*Sandwich panels, Nondestructive testing, Air transportable equipment, Bonding, Ultrasonic tests, Defects (Materials), Field tests

DESCRIPTORS (U) Shelters, \*Sandwich panels, Nondestructive testing, Air transportable equipment, Bonding, Ultrasonic tests, Defects (Materials), Field tests

IAC NO NT 010875

IAC DOCUMENT TYPE NTIAC - MICROFICHE

IAC SUBJECT TERMS N (U) EDDY-SONICS, \*ULTRASONIC

AD-A007 033

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AD-A007 033 CONTINUED  
INSPECTION, \*SANDWICH CONSTRUCTION, INSPECTION, UNCOND,  
DEFECTS(MATERIALS).

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055028  
AD-A008 400 11/6 13/2

AIR FORCE CIVIL ENGINEERING CENTER RANDALL AFB FLA

(U) CIVIL Engineering Corrosion Control Volume III  
Cathodic Protection Design

DESCRIPTIVE NOTE Final rept May 72-Nov 74.

FEB 75 202P

PERSONAL AUTHORS West, Lewis H., Lewicki, Thomas F. :

REPORT NO AFCIC-TR-74-B-Vol-3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 2, AD/A-004 083

ABSTRACT. (U) The report is specifically written for Air Force Civil Engineering personnel but can be useful to all Agencies of the Federal Government. It covers mainly Real property and Real property installed equipment. It deals with corrosion and corrosion control of buried and submerged metal structures. Causes and theory of corrosion, material selection, protective coatings, and cathodic protection application are included. The information contained herein will be useful for solving all corrosion problems encountered on real property and real property installed equipment. Portions of this document are not fully legible

DESCRIPTORS (U) \*corrosion inhibition, \*cathodic protection, Underground structures, Underwater structures, Corrosion, protective coatings, Civil engineering, Materials, Selection

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AD-A008 384 7/1 13/2 DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO 055028  
 THICKUL CORP BRIGHAM CITY UTAH WASATCH DIV 2A ADOB 140 1/1 1  
 (U) The Treatment and Analysis of Cyanide Wastewater AIR FORCE CIVIL ENGINEERING CENTER FORT BELVOIR, AFSC 140  
 DESCRIPTIVE NOTE (U) A Computer Program for Right-of-Way Design Evaluations. Final Rept Jun 71-Dec 74  
 FEB 75 122P (U) A Computer Program for Right-of-Way Design Evaluations. Final Rept Jun 71-Dec 74  
 PERSONAL AUTHORS Clark, D P, Poirier, L W, Wilson, D W  
 CHRISTENSEN, W M McClellan, Lloyd P  
 CONTRACT NO F08036-74-C-0001 REPORT NO AFCEC-TR-74-7  
 PROJECT NO AF-2054 UNCLASSIFIED REPORT  
 TASK NO 205403 ABS/R/C/T (U) This document presents a computer program which computes Allowable Gross Loads (AGL's) for various aircraft wheel configurations on rigid airfield pavements. Full program documentation, including flow charts, program listing and sample output are included  
 MONITOR AFCEC  
 TR-74-5 UNCLASSIFIED REPORT  
 DESCRIPTORS (U) Landing fields, Pavements, Weight  
 (U) Landing forces, Concrete, Traffic, Capacity (Quantity). Computer programs  
 ABSTRACT (U) The report concerns the treatment of industrial wastes containing cyanides, especially wastes from electroplating processes. The prototype system treatment concept is essentially chlorination via electrolytic generation of chlorine in the waste water. Design and operating aspects are discussed. Other cyanide treatment processes are reviewed and analytical techniques are discussed.  
 DESCRIPTORS (U) Cyanides, Chlorination, Electroplating, Water pollution, Prototypes, Chemical analysis, Test methods, Waste treatment, Electrolysis, Electrochemistry, Pilot Plants, Performance (Engineering)  
 IDENTIFIERS (U) Industrial waste treatment, Water pollution control, Water analysis  
 IAC NO PL-901100 UNCLASSIFIED  
 IAC DOCUMENT TYPE PLASTIC - MICROFICHE --  
 IAC SUBJECT TERMS P- (U) Prototypes, Chlorination, Cyanides, Waste waters, Streams, Industrial wastes, Electroplating, Treatment Plants, Thikol, Scrubbers, Testing, Effluents, Sampling, Stack gases, Emissions, Design, 22 KtOp, 22 Unlimited  
 AD-A008 394 AFCEC-TR-74-7 055028

## UNCLASSIFIED

AD-A004 983 11/0 13/2

HINCHMAN CORP DETROIT MICH

(U) Civil Engineering Corrosion Control Volume 11  
Cathodic Protection Testing Methods and Instruments

DESCRIPTIVE NOTE. Final rept May 72-Nov 74.

JAN 75 128P

PERSONAL AUTHORS West, Lewis H. Lewicki, Thomas F. :

CONTRACT NO F33615-72-C-0400

MONITOR AFCEC TR-74-8-Vol-2

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 1, AD/A-001 082

ABSTRACT (U) Laboratory and field test methods are discussed. Some basic test instruments are described and their application in the field is discussed

DESCRIPTORS (U) Corrosion inhibition, Civil engineering, Cathodic protection, Underwater structures, Underwater structures, Corrosion, Test methods, Test equipment

IXIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO 055008  
AD-A004 082 11/6

HINCHMAN CORP DE/RCIT MICH

(U) Civil Engineering Corrosion Control Volume 1  
Corrosion Control - General

DESCRIPTIVE NOTE Final rept May 72-May 74.

JAN 76 283P

PERSONAL AUTHORS West, Lewis H. Lewicki, Thomas F. :

CONTRACT NO F33615-72-C-0400

MONITOR AFCEC

TR-74-8-Vol-1

## UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE See also Volume 2, AD/A-004083

ABSTRACT (U) The report deals with corrosion and corrosion control of buried and submerged metal structures. Causes and theory of corrosion, materials selection, protective coatings, and cathodic protection are included. The information contained herein will be useful for solving all corrosion problems encountered on real property and real property installed equipment

DESCRIPTORS (U) Corrosion inhibition, Civil engineering, Corrosion, Under ground structures, Underwater structures, Cathodic protection

UNCLASSIFIED

AD- 783 516 8/5

MISSOURI UNIV COLUMBIA JOHN W DALTON RESEARCH CENTER

(U) Investigation of the Effects of Low Intensity Electrical Currents on Wound Infection and Healing

Annual summary report no 2, 1 Jul 72-30 Jun 73.

CONTRACT NO. F08674 32P

PERSONAL AUTHORS Rowley, Blair A.; McCormick, John W.; Kotcot, Lester E.; Chase, Gerald R.

CONTRACT NO. DADA17-72-C-2006

UNCLASSIFIED REPORT

ABSTRACT (U) The report presents the results of a threefold project: application of cyclic electrical current to *Pseudomonas aeruginosa* infection, enhancement of wound healing using low level direct currents, and electrical current effects on tissue cell cultures

DESCRIPTORS (U) electric current, healing, wounds and injuries, tissue culture, biocides, *Pseudomonas aeruginosa*, bacteria, infectious diseases, experimental data, therapy, rabbits, laboratory animals

SEARCH CONTROL NO 056028

AD- 782 221 15/5 14/2

GENERAL AMERICAN TRANSPORTATION CORP NILES ILL GENERAL AMERICAN RESEARCH DIV

(U) Nondestructive Inspection of Shelter Panels Phase 1 Functional Model

DESCRIPTIVE NOTE Interim rept Sep 73-Apr 74.

MAY '74 88P

PERSONAL AUTHORS Kraska, Irvin R.; Wolf, John J.

CONTRACT NO F33657-71-C-1852

PROJECT NO AF 2054

TASK NO 205402

MONITOR: AFCC TR-74-3

UNCLASSIFIED REPORT

ABSTRACT (U) The report summarizes the first phase of an effort to develop equipment and procedures to inspect sandwich panels in air transportable shelters in the field. A rapid and simple-to-operate system has been developed, utilizing a unique eddy sonic technique for metal-faced panels and pitch-catch ultrasonic techniques for nominal sandwich panels. The location(s) of debonds and free moisture in the panel are reliably detectable with the system. A functional model has been successfully field tested (author)

DESCRIPTORS (U) \*Shelters, \*sandwich panels, \*nondestructive testing, ultrasonic tests, air transportable equipment, bonding, defects, materials, field tests

IAC NO NT-009479

IAC DOCUMENT TYPE NTIAC MICROFICHE --

IAC SUBJECT TERMS N-(U) INSERVICE INSPECTION, \*CONSTRUCTION, \*PANELS (STRUCTURAL), \*SANDWICH CONSTRUCTION, \*UNBOND, WATER, MOISTURE, MOISTURE CONTENT, DEFECTS (MATERIALS), AIR FORCE EQUIPMENT, LAMINATES, RELIABILITY, FIELD TESTS, DETECTION, MAINTENANCE.

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DTIC REPORT & BIBLIOGRAPHY

SEARCH CONTROL NO 055028

DEVELOPMENT, TEST EQUIPMENT, TEST SPECIFICATIONS,  
PROCEDURES, TEST METHODS, METALS, SHEETS, FIBEROASS,  
REINFORCED PLASTICS, PAPER, HONEYCOMB STRUCTURES, WOOD,  
FOAM, EDDY-SONICS, EDDY CURRENT INSPECTION, ULTRASONICS,  
ULTRASONIC TESTING, HIGH FREQUENCY, LOW FREQUENCY,  
LABORATORY EQUIPMENT, EXPERIMENTAL DATA, COUPLANTS.

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